SOLAR ECO NAVi

Operation Manual

Version 1.2 October 30th , 2012

SOLAR ECO NAVI

The all-in-one TOUCH data logger

Monitoring your solar system so easy

User Friendly

- Elegant ID design with sensitive touch screen
- Graphical display and intuitive use interface
- Support multiple languages
- Extensible communication protocal (Customized)

Flexible

- Multi-communication interface
- Wall mounted or standalone with frame supported
- Integrated wireless interface (Option)
- Two sets analog inputs for temperature and irradiance sensors (Option)
- Monitor data from power meter (Option)

Reliable

- Data loss protection, automatic backup
- Get data from File Transfer Protocol (FTP) by CSV file with Excel or from USB stick for local export data
- Data can be synchronized on web monitoring system (Customized)

Efficient

- Support for 20 units of PV inverters
- Obtain comprehensive information rapidly
- Automatic daily report and alarm via SMS or E-Mail
- 1/12 power consumption less than that of a computer

Innovation in System Monitoring

Solar ECO NAVI is an easy-used solar monitoring system with large size of colorful TFT LCD touch panel. It doesn't need any special software for users, and it's also a reliable and low cost monitoring solution.

Solar ECO NAVI power consumption is lower than that of a computer (5€ / year). Users monitor numerous inverters easily and more economically.

Easy operate colorful TFT LCD touch panel
External sensor to get complete information for your solar system
Data synchronize save into web monitoring system to monitor your power systerm anywhere
Integrated wireless (Zigbee) interface for friendly use
SOLAR ECO NAVI

Where Can We Use Solar ECO NAVI in the PV system?

Solar ECO NAVI can apply between inverter and other computers. It is an excellent communication device. It's also applied to a standalone PV monitoring system.

How Does Solar ECO NAVI Work?

Solar ECO NAVI retrieves data from PV inverters via wire / wireless and records it on SD card. It provides a service to send diary report and event alarm to end users via E-Mail or SMS. It includeds FTP service **to get** remote data for users, or local exported data to USB stick. Further data also can be synchronized on customer's web moitoring system through Internet to monitor PV inverters anywhere.

Touch Panel Display :

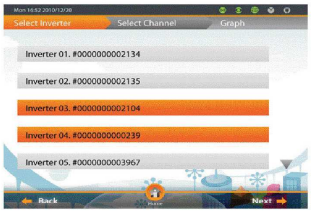
Main Screen

Standby status

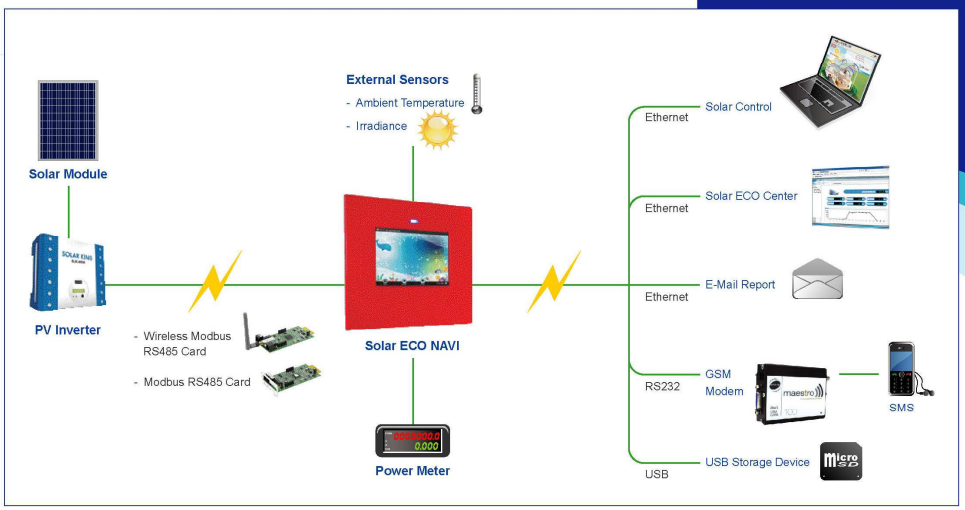
Showing data of Power / Day Yield / Total Yield / CO_2 Emission / Money etc.

Tool Box

Monitoring each inverter data



Communication Diagram :



Bottom View

Specification:

Model	Solar ECO NANI
Main Machine	Size : 20 x 20 x 3.65 cm IP 20 protection class
LCD Screen	5.6-inch TFT touch panel, 640 x 480 pixels / 65K colors
Operating Temperature	-10 to 40°C
Storage Temperature	-20 to 60°C
Alarm Relay	Rating : 1A / 24VDC
	Terminals : 4 x 1 socket (C, C, NO, NC)
Communication Interface	RS232 : DB9 male connctor for PC / Modem ; Baud Rate : 9600bps
	RS485 : 4 x 1 socket (R+, R-, T+, T-), full-duplex for connection to inverter terminals
	Ethernet : RJ45 socket ; 10/100M bit
Analog Input	Pin 2 & Pin 3 (for Temperature Sensors) Input Impedance, 1M ohms
	Pin 5 & Pin 6 (for Temperature Sensors) Input Impedance, 1M ohms
	Input Voltage Range, 0-150mV
Maximum Inverters connected	20 inverters
Storage Type	Micro SD card, 1G memory capacity

Powercom Co., Ltd.
9F, No.246, Lien Chen Road, Zhong He District, New Taipei City, Taiwan, R.O.C.
Tel : 886-2-22258552 Fax : 886-2-22251776
http : //www.pcmups.com.tw E-mail : market@upspowercom.com.tw

An extraordinary product comes from **POWERCOM**
www.pcmups.com.tw

Contents

Chapter 1: Introduction.....8
1.1 Cautions.....8
1.2 Standards.....9
1.3 Touchscreen Display.....9
1.4 Overview.....9
1.4.1 What's Solar ECO NAVI?.....10
1.4.2 Where can we use Solar ECO NAVI in the PV system?.....10
1.4.3 How does Solar ECO NAVI work?.....10
1.4.4 The four major features of Solar ECO NAVI.....11
1.5 Function Tree.....12

Chapter 2: Installation.....13
2.1 Installation Location.....13
2.2 Package List.....13
2.3 Placing.....14
2.4 Front View.....15
2.5 Bottom View.....16
2.5.1 RS232.....16
2.5.2 RJ11 RJ12.....16
2.5.3 Switching RS485/422.....16
2.5.4 RJ45.....16
2.5.5 Terminal Block.....16
2.6 Side View.....18
2.7 Rear View and Dimension.....18

Chapter 3: Manual.....18
3.1 Start: On / Off and Standby.....18
3.2 Initial Screen.....19
3.2.1 InvList.....22
3.2.2 Chart.....23
3.2.3 Sensor.....26
3.2.4 Event.....27
3.2.5 Setting.....29
3.2.5.1 Inv. brand.....29
3.2.5.2 List item.....29

3.2.5.3 Wireless.....31
3.2.5.4 Export.....31
3.2.5.4.1 System IP.....32
3.2.5.4.2 Data center.....34
3.2.5.4.3 FTP server.....36
3.2.5.4.4 Local backup.....37
3.2.5.4.5 Erase all data.....41
3.2.5.5 Report.....41
3.2.5.5.1 Email report.....42
3.2.5.5.2 SMS report.....46
3.2.5.6 Config. Inv.....48
3.2.5.7 Sensor addr.....49
3.2.5.8 Relay.....51
3.2.5.9 Buzzer.....51
3.2.5.10 System.....52
3.2.5.10.1 Avoided CO_2.....53
3.2.5.10.2 Adjust touch screen.....54
3.2.5.10.3 Feed-in Tariff.....54
3.2.5.10.4 Standby mode.....56
3.2.5.10.5 Date & Time.....57
3.2.5.10.6 Language.....59
3.2.5.11 Update.....60
3.2.5.12 Message.....61
3.2.5.12.1 Help.....61
3.2.5.12.2 Version.....61
3.2.5.12.3 License.....62
3.3 Product Specification.....63
3.4 Troubleshooting.....64
3.5 CE & FCC Certification.....65

Chapter 1: Introduction

Please go through the manual before you start.

Thank you for purchasing Solar ECO-NAVI. Solar ECO NAVI represents the latest product of **POWERCOM** supply chain. The all- in- one touch data logger completely integrates cloud computing monitoring and external sensors. The practical logger for Photovoltaic Inverters (PV Inverters) is user friendly, flexible, reliable and efficient.

If you come across any difficulties during installation or operation, please refer to this manual before you contact with your dealer. This manual contains important instructions. It can help you solve most difficulties during the process of installing or operating.

To obtain the latest product information and user manual, please visit our website: http:// www.pcmups.com.tw

Thank you again for selecting an extraordinary product from **POWERCOM**. Please keep the manual handy for your immediate reference. Now get ready to use our Solar ECO-NAVI for your colorful life!

Copyright 2011

No part of this manual may be reproduced without the written consent of the manufacturer. All rights reserved.

1.1 Cautions

First read the following safety instructions. To maintain in good condition, care must be taken in handling the equipment (delivery, storage, installation, start-up, and operation). These safety instructions must be noticed--otherwise it can endanger the product itself, and other installations can be damaged.

1. Unpack Solar ECO-NAVI carefully. Inspect the unit and accessories for any damages or scratch marks. If any problems are encountered, please contact with your local dealer immediately.
2. Never expose the unit to dampness, dust or corrosive liquids.
3. Don't remove the micro SD card.
4. Never attempt to open the device nor repair Solar ECO-NAVI.
   Opening or removing covers could damage the device. Only qualified customer service personnel can overhaul the device.

5. Use the AC adapter with this product only. Using other adaptors can damage the unit.
6. Do not open the AC adaptor. This can cause electric shock.
7. Plug the AC adaptor in proper voltage range. Improper voltage settings may damage the adaptor.

1.2 Standards

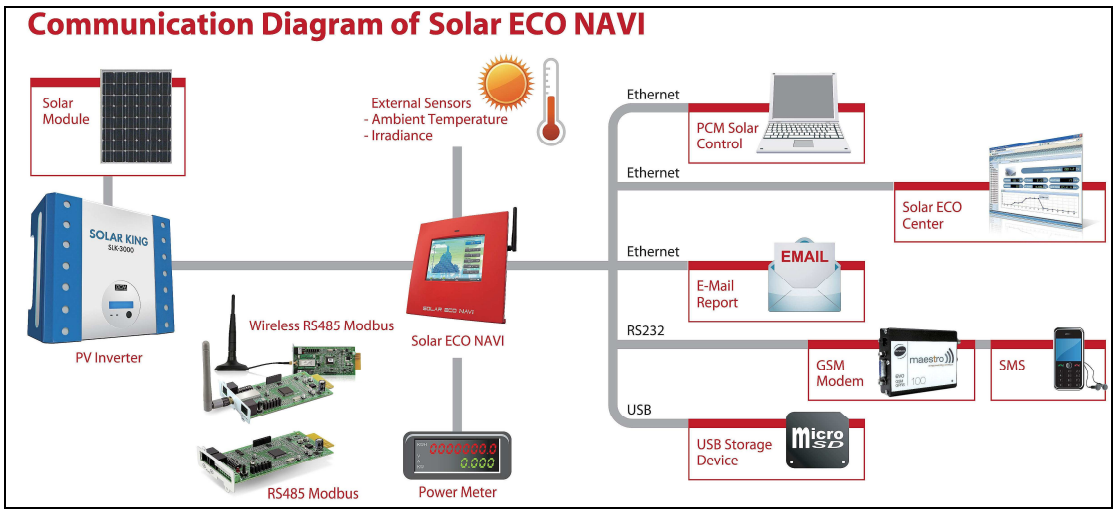
Solar ECO NAVI operates on 12Volt /1A DC. Please use only the enclosed power adapter. The relay can be used with maximum 24VoltDC**.** Solar ECO NAVI has IP20 standard protection class and it is designed exclusively for installation in dry, dust-free interiors.
Before turning on the power switch of the Solar ECO NAVI, please make sure that all cables connect with the device well. If adjusting any cables under working status, inverter data may appear abnormal values.

1.3 Touchscreen Display

Solar ECO-NAVI can be operated effortlessly via the inset touchscreen. Touchscreen means you can use your finger to choose items on the screen.
You just have to lightly "point" with the tip of your finger to the selected function and then the following image will show on the screen.
If the device doesn't respond immediately, wait a few seconds and try again. Under no circumstances press harder on the screen. Using a hard sharp object can break the glass area and lead to lose the guarantee.
The display has touch points everywhere, which means the controls can be spread out everywhere throughout the display. Do not press 2 or more points at a time. It may have no responses or cause a crash when pressing 2 or more points at the same time.

1.4 Overview

Solar ECO NAVI is an integrated Logger for Photovoltaic Inverters (PV Inverters). It supports 5 communication interfaces: (1) RS-232 (2) RJ-11, RJ-12 for switching RS-485 and RS-422 (3) RJ-45: Ethernet (4) Terminal Block (5) USB. And it also supports other communication mechanisms to provide status and/or error reports on regular intervals or in predetermined events.



1.4.1 What's Solar ECO NAVI?

Solar ECO NAVI is a powerful data monitor, processor, and recorder designed for PV inverters. It shows all the statuses of inverters. It is exquisite and lightweight. The screen size is 5.6 inches and the net weight is only 545 grams. The appearance is modern and aesthetic. Solar ECO NAVI combines 3 main functions: Web monitoring system, external sensors and data logger with touch panel monitor. It doesn't need any special software for users to operate. Moreover, it's a reliable and low-cost monitoring solution.

1.4.2 Where can we use Solar ECO NAVI in the PV system?

Solar ECO NAVI can apply between inverters and other computers. It is an excellent communication device. It also can be a standalone PV monitoring system.

1.4.3 How does Solar ECO NAVI work?

Solar ECO NAVI retrieves data from inverters via wire/wireless and records the data on a micro SD card, 1 G memory capacity. Solar ECO NAVI can send the data via SMS or E-mail to end users. Besides, Solar ECO NAVI can transfer those data to colorful graphs so as to clearly show the inverter status to users. The main functions are:

1. Monitor the performance of a PV system
2. Store history data in its micro SD(Secure Digital) card
3. Change the operational parameters of inverters

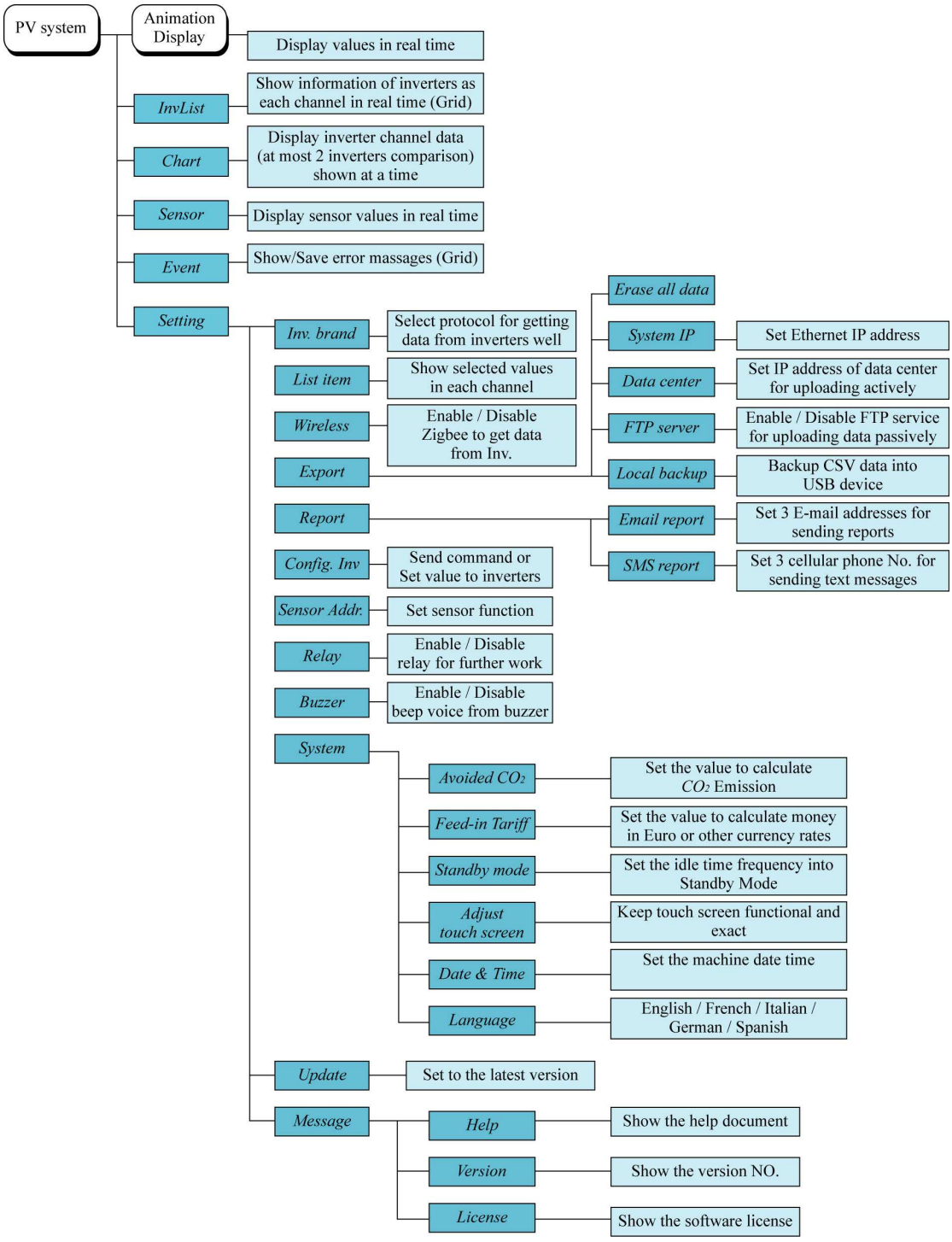
4. Present inverter data in graphical displays
5. Sending SMS and E-mail for notification
6. Monitor the temperature and irradiance with additional sensors

1.4.4 The four major features of Solar ECO NAVI

1. User Friendly
(1) Intelligent Design(ID) with sensitive 5.6-inch TFT LCD touch screen (2) Graphical User Display and intuitive user interface (3) Support Multilingual User Interface (MUI) (4) Customizable page design (5) Compatible with multiple brands of PV inverters
2. Flexible
(1) Multi-communication interface and (2) Integrated wire/wireless interface (3) Wall mounted or standalone with frame supporters (4) Two sets of analog inputs for temperature and irradiance sensors (5) Monitor data from power meter
3. Reliable
(1) Automatic backup to prevent data loss (2) Get data from File Transfer Protocol (FTP) by Comma Separated Values(CSV) file format or from USB sticks for near-end export data (3) External sensors to get complete information for the solar system (4) Data can be synchronized on Web monitoring system through Internet (5) 3-year data logging capacity
4. Efficient
(1) Support for 20 units of PV inverters (2) Obtain comprehensive information rapidly (3) Automatic daily report and alarm notification via SMS or E-mail (4) Monitor the power system anytime anywhere (5) The power consumption is 92% less than that of a computer

1.5 Function Tree

The following function tree offers an outline of the available dialogues.


PV system
Animation Display
Display values in real time
InvList
Show information of inverters as each channel in real time (Grid)
Chart
Display inverter channel data (at most 2 inverters comparison) shown at a time
Sensor
Display sensor values in real time
Event
Show/Save error massages (Grid)
Setting
Inv. brand
Select protocol for getting data from inverters well
List item
Show selected values in each channel
Wireless
Enable / Disable Zigbee to get data from Inv.
Export
Erase all data
System IP
Set Ethernet IP address
Data center
Set IP address of data center for uploading actively
FTP server
Enable / Disable FTP service for uploading data passively
Local backup
Backup CSV data into USB device
Report
Email report
Set 3 E-mail addresses for sending reports
SMS report
Set 3 cellular phone No. for sending text messages
Config. Inv
Send command or Set value to inverters
Sensor Addr.
Set sensor function
Relay
Enable / Disable relay for further work
Buzzer
Enable / Disable beep voice from buzzer
System
Avoided CO2
Set the value to calculate CO2 Emission
Feed-in Tariff
Set the value to calculate money in Euro or other currency rates
Standby mode
Set the idle time frequency into Standby Mode
Adjust touch screen
Keep touch screen functional and exact
Date & Time
Set the machine date time
Language
English / French / Italian / German / Spanish
Update
Set to the latest version
Message
Help
Show the help document
Version
Show the version NO.
License
Show the software license

Chapter 2: Installation

The installation of Solar ECO NAVI must be executed indoors and protected from dust, dampness and corrosive liquids. For outdoor, dusty, or dampness surroundings, Solar ECO NAVI needs to be with appropriate protective and sufficient housings.

2.1 Installation Location

For the best results when installing Solar ECO NAVI, please consider the following locations:

1. Install indoors or protect from sunlight, rain and dust
2. Place the unit where the LCD screen can be easily read and operated
3. Reduce the distance between Solar ECO NAVI and inverters

2.2 Package List

When receiving Solar ECO NAVI, there are following components in the package.

(1) Basic Equipment

1. Solar ECO NAVI- Basic Unit
2. Truss Tapping Screw M4*19 # 2 units
3. Plastic Anchor PEB6-60 # 2 units
4. Antenna RFA-02-C2M2-M10-N (2.4-2.5GHz 2dBi) # 1 unit
5. 12V Universal Power Adapter # 1 unit
6. Support frame # 1 unit

Solar ECO NAVI

Truss Tapping Screw

Plastic Anchor

Support frame

Antenna

12V Universal Power Adapter

(2) Optional Equipment

1. GSM Modem M100evo IP & ACC-PS01+A01+CA01
2. Modbus RS485 Card
3. Wireless Modbus RS485 Card For Indoors
4. Wireless Modbus RS485 Card For Outdoors(with a silver magnetic sticker)

   The maximum detection distance of wireless is 1 km.

GSM Modem M100evo

Modbus RS485 Card

Wireless Modbus RS485 Card For Indoors

Wireless Modbus RS485 Card For Outdoors

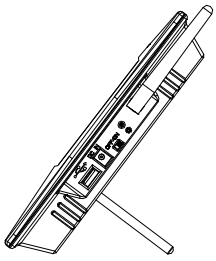
Solar ECO NAVI & SOLAR KING

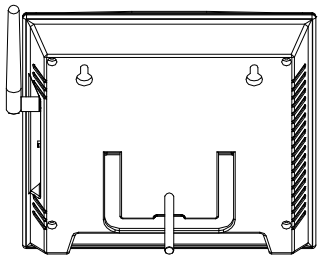
2.3 Placing

Solar ECO NAVI is designed not only for desktop but also for mount application. To mount Solar ECO NAVI, the standard set of mounting kit is needed.

(1) Desktop Solar ECO NAVI

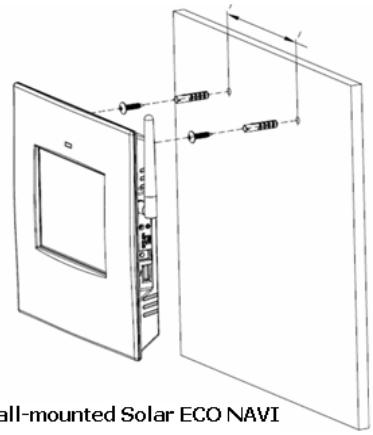
1. Put Solar ECO NAVI the device lightly on the desk or a flat surface to avoid damaging the bracket.
2. Arrange the basic and optional equipments.



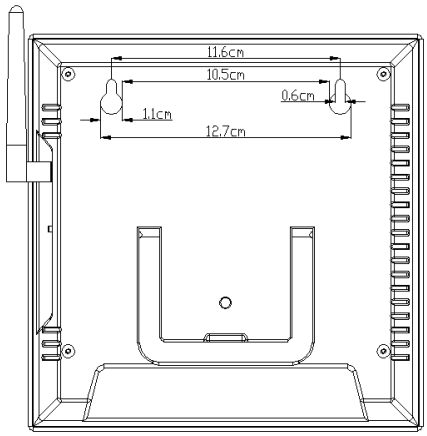


(2) Mounting Solar ECO NAVI

1. Select a solid, vertical and strong surface or wall to support the device.
2. Leave enough space between Solar ECO NAVI and nearby surfaces. Reserve space for operating and connecting with external accessories.
3. Mark the positions of 2 mounting holes. The exact distance measurements are well illustrated below.
4. Fix Solar ECO NAVI by 2 Truss Tapping Screws.
5. Arrange the basic and optional equipments.



Wall-mounted Solar ECO NAVI



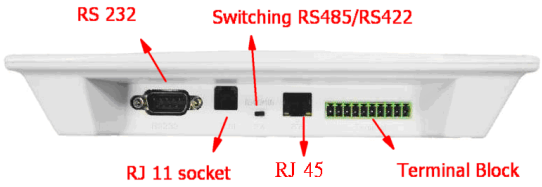
Distance measurements of Wall-mounted Solar ECO NAVI

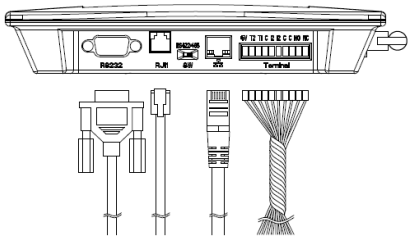
2.4 Front View

Table 2.4 Front View

Main screen	Description
LED Light	Under the operation mode, it keeps blue. When updating new software or the device enters a standby mode, it flashes.
Antenna	It can transmit or receive signals.
Colorful Touch Panel	Modern urbanization pattern with colorful design make the touchscreen clear at a glance.

2.5 Bottom View





2.5.1 RS232

This is a male DB9 RS232 socket for connecting to a GSM modem or computer. Using a GSM modem, automatic daily report and alarm notification can be sent by SMS. GSM Modem M100evo is optional equipment.

2.5.2 RJ11 RJ12

This socket provides RS422 and RS485 cable for connecting inverters.
In regard to the inverter working system, the inverters must be equipped with RS485 cards. Pay attention to the polarity of connections below.

Solar ECO NAVI side(RS485 interface)	R+	R-	T+	T-
Inverter 1 side(On RS485 Card)	R+	R-	T+	T-

Note: Please set inverter slave address number on Modbus RS485 Card between 1 and 25.

2.5.3 Switching RS485/422

To switch RS422 and RS485, the pivot offers the change. Please select RS485, Half Duplex when Solar ECO NAVI connects with wired sensor meter.

2.5.4 RJ45

This interface is for the connection of Ethernet, applying to LAN (Local Area Network). It's generally connected to an Ethernet hub, so E-mail can be delivered and FTP can be uploaded.

2.5.5 Terminal Block

At the rear panel of Solar ECO NAVI, there is a 10-pin connector. There are 2 main setting functions. One is Sensor, the other one is Relay.

(1) Irradiance and Temperature Sensors

The left 6 pins are assigned to connect 2 sets of irradiance and temperature sensors. The following illustration depicts the sensor connections.

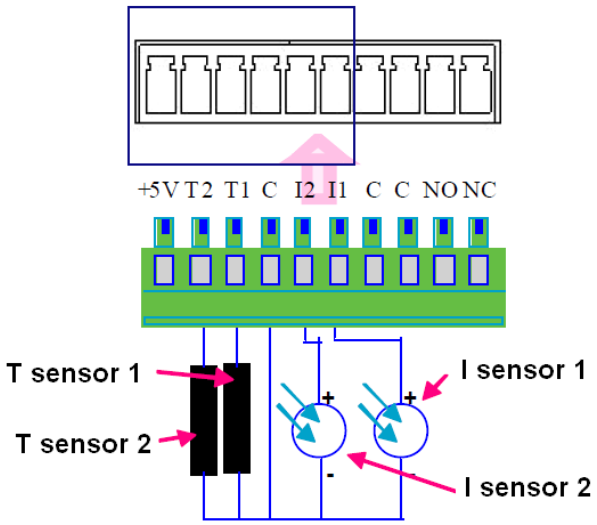
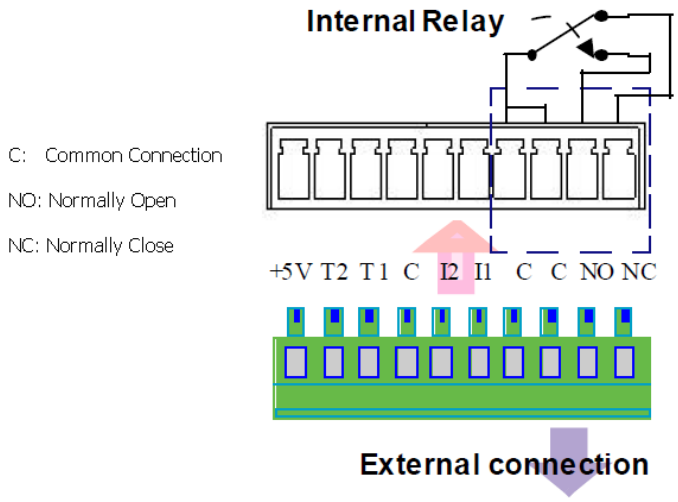


Table 2.5.5 Sensor

Pin	Description
+5V	5V for external supply, +/- 5%, 500mA maximal
T2	T (Temperature) sensor input 2
T1	T (Temperature) sensor input 1
C	Common point for T1, T2, I1 and I2
I2	I(Irradiance) sensor input 2 (positive)
I1	I(Irradiance) sensor input 1 (positive)

(2) Alarm Relay

Alarm Relay: A relay is for external signals or devices. The internal and external connections are shown below.

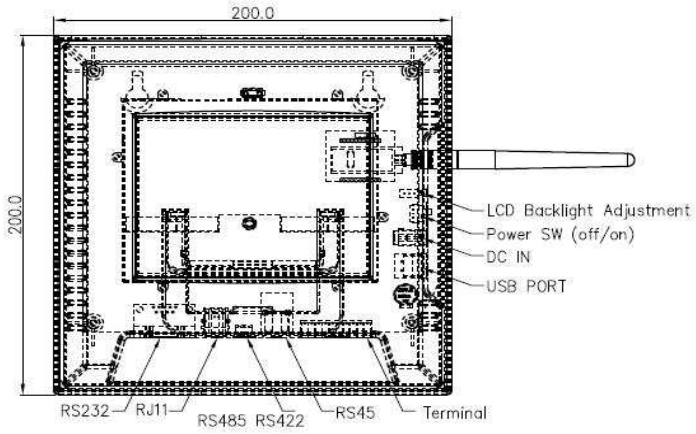


2.6 Side View

Table 2.6 Side View

Function port	Description
USB	Connect USB line to upload data.
DC IN	Connect this socket by the DC power from the AC power adapter. For proper usage, please use the adapter included in the package only.
Power Switch	To turn on and turn off power.
Brightness Control	Adjust the screen light by a flat-headed screwdriver
Antenna	It can transmit or receive signals.

2.7 Rear View and Dimension



Chapter 3: Manual

3.1 Start: On / Off

After connecting the AC adaptor to DC IN on the right side of Solar ECO NAVI, turn ON Power Switch and then there are three beeps. After a few seconds, the screen enters Date & Time with a daytime mode and you can enjoy the product and start a long-term monitoring. To turn off Solar ECO NAVI, turn OFF Power Switch and the device is off immediately.

3.2 Initial Screen

In accordance with the trend of environmental protection, it comes into being the product of green energy technology, Solar ECO NAVI. Among the solar system, it is representative of the leading navigator for maintaining the ecological environment.

After switching on the device, if the connections are correct, the first initial screen with logo and firmware information displays.

Figure 1 Boot Screen

After the boot screen, Date & Time setting displays. Do check Time zone, Date and Time are in the correct region. All data recorded from now on is based on the setting. If the setting is not consistent with your local area, please refer to Date & Time (Section 3.2.5.10.5) and use the operating steps to fix the setting.

Figure 2 Date & Time

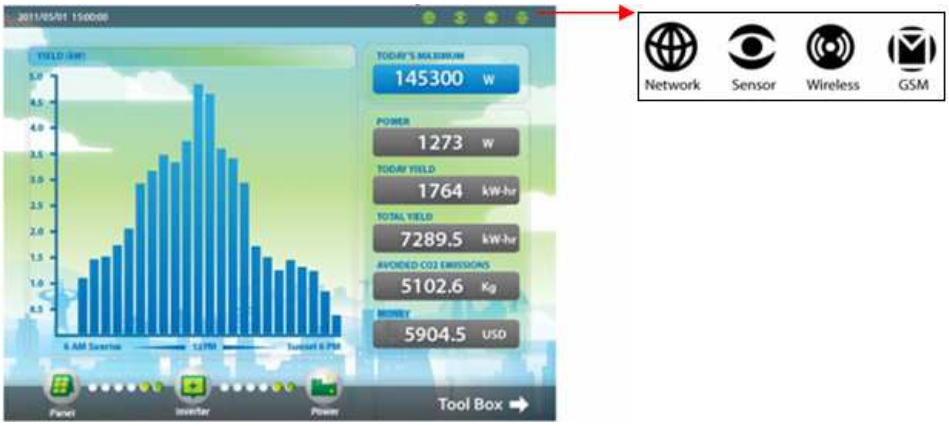


Figure 3 Main Display–Daytime pattern

After completing Date & Time setting, Solar ECO NAVI starts searching inverters; meanwhile, the marquee begins running. Once the device searches inverters successfully, the information of the connected inverters starts to be recorded correctly. From the third display, the graph shows output power histogram and records per bar per 30 minutes from 6 A.M. to 6 P.M. There are 4 icons on the upper right of the picture, and the detailed description list below. If the icon turns green, it means the function is switched on; otherwise, the color of the icon is gray.

There are 6 values shown on the right part of the picture, and according to inverters, it offers users to observe the most concerned items in a chart. The 6 values update per 10 seconds.

TODAY'S MAXIMUM: Solar Energy System generates the maximum output power within today.
POWER: It represents the present output power of Solar Energy System.
TODAY YIELD: Solar Energy System yields total output power of today.
TOTAL YIELD: It means the accumulated output power that Solar Energy System yields from the first day of generating power.
AVOIDED CO2 EMISSIONS: The accumulated CO_2 emissions that Solar Energy System avoids producing from the first day of generating power.
MONEY: The accumulated revenues that the unit calculates according to tariff.

Note: The histogram will disappear when restarting Solar ECO NAVI or tapping "Scan" on the Inverter list interface. If inverter errors occur, the histogram won't continue showing until error fixed.

Figure 4 Main Display – Nighttime pattern

If Solar ECO NAVI doesn't connect with inverters or inverters aren't under working status for around 5 minutes, it will get into a nighttime mode and marquee will stop running.

Table 3.2 Icon Explanation

Network	When Solar ECO NAVI connects with Internet, the Network mark will turn green from gray. After completing System IP setting and enabling the status on Email report, inverter status can be delivered to the recipient's mailbox.
Sensor	Enable Sensor addr. function, and the Sensor mark will turn green from gray. After setting temperature, irradiance, AC, and DC meter addresses, the 4 sensor values will be showed on Sensor.
Wireless	Enable Wireless function, and the Wireless mark will turn green from gray. Please make sure Wireless Modbus RS485 Card is set properly. Zigbee transmission distance is up to 1 km.
GSM	Enable SMS report function, and the GSM mark will turn green from gray. Please check the GSM modem connects to RS232 port properly to deliver text messages successfully.

After tapping "Tool Box" on the main screen, the left screen displays.

Figure 5 Tool Box

InvList: Search, remove, or re-register inverters.
List channel information of registered inverters.

Chart: A chart displays the selected channel of the inverter.
Sensor: Display sensor values promptly.
Event: Show error messages with time and value.
Setting: There are 12 internal settings: Inverter brand, List item, Wireless, Export, Report, Config. inverter, Sensor Address, Relay, Buzzer, System, Update, and Message.

3.2.1 InvList

After completing Date & Time setting, Solar ECO NAVI starts to record all PV inverter information in the monitoring system.

Tap the "**InvList"** icon from Tool Box, and it displays all connected inverters. Select one inverter and tap **"Next"** to see the information.

Figure 6 InvList

Figure 6.1 Inverter list

Scan: Search all inverters connected to Solar ECO NAVI.

*Note: When connecting with inverters for a while, tapping **"Scan"**, the original histogram on the **Home** graph disappears. After 5 minutes, the graph shows new output power histogram.*

Delete: Remove any of inverters from the list, please tap the line and choose the upper gray block **"Delete"** to eliminate the inverter out of the system.

Delete all: Remove all of inverters from the list, please tap the upper gray block **"Delete all"** to eliminate all of inverter lines on the screen.

Total: Show the number of inverters connected with Solar ECO NAVI.
▼: Due to the screen size, display 5 inverters at most. If other inverters are needed to observe, please drag ▼ on the lower right of the frame.

Table 3.2.1 Inverter Status

	The inverter doesn't connect to the device.
	The condition of the inverter is normal.
	A current fault in operation, i.e. unusual grid conditions or inverter error.
	An abnormal condition occurred during the last 48 hours but had recovered.

After selecting the inverter, the information of the indicated inverter is shown. The 4 items below are basic information, and the other 5 items can be selected from Setting→ List item (Section 3.2.5.2).

Figure 6.2 Single Inverter Information

SN.: Inverter serial number

Mode: There are three situations, Normal, Wait or Fault. Normal mode means the inverter is under working status. Wait mode means the inverter isn't ready to connect with the grid, and there is no power output yet. Fault mode means the inverter has occurred errors.

E-Total: Today's accumulated energy (kW-hr)

E-Today: Total accumulated energy (kW-hr)

3.2.2 Chart

Select at most 2 inverters at a time to observe one inverter channel, and then the screen displays a chart to show curves of the selected inverter channel for observation and comparison.

Tap the **"Chart"** icon from Tool Box, and see the connected inverters. Choose one inverter from the list, and tap "Next".

Figure 7 Chart

Figure 7.1 Inverter

Figure 7.2 Only for two inverters

At most 2 inverters can be selected at a time. If selecting over 2 inverters, the screen will display the sign "Only for two inverters."

Figure 7.3 Channel

On the screen, there are 16 channels to select. Channel is the type of inverter data transferred to Solar ECO NAVI. Each channel is explained in the following table.

Table 3.2.2 Explanation of Channel

Channel	Description
Temp	Inverter internal temperature(^{O}C)
Iac	Output AC current (amp)
Vac	Output AC voltage (volt)
Fac	Utility frequency (Hz)
Pac	Output AC power (kW)
Zac	Utility impedance (m-ohm)
E-TI	Accumulated energy(kWh)
Vpv1	PV input DC voltage of 1 MPPT tracker (volt)
Vpv2	PV input DC voltage of 2 MPPT trackers (volt)
Vpv3	PV input DC voltage of 3 MPPT trackers (volt)
Ipv1	PV input DC current of 1 MPPT tracker (amp)
Ipv2	PV input DC current of 2 MPPT trackers(amp)
Ipv3	PV input DC current of 3 MPPT trackers(amp)
Ppv1	PV input DC power of 1 MPPT tracker (watt)
Ppv2	PV input DC power of 2 MPPT trackers (watt)
Ppv3	PV input DC power of 3 MPPT trackers (watt)

Notice: For the present design, please only select the single tracker to observe inverter data.

Figure 7.4 Chart

To display the channel in chart, select time range. The 4 periods are explained in the following table.

Table 3.2.2 Explanation of Period

Period	Description
Today	The display range covers one day.
Week	The display range covers one week.
Month	The display range covers one month.
Year	The display range covers one year.

Solar ECO NAVI plots a chart of averaged points.

Tap **"Next"** and a chart showing the selected channel over the time period displays.

Figure 7.5 Chart

3.2.3 Sensor

Tap the "**Sensor"** icon from Tool Box. It displays real-time sensor values.

Figure 8 Sensor

Figure 8.1 Sensor

Before connecting sensors or there is no sensor detected, the value reads "NA." There are 2 sets of analog inputs for connection to sensors. Insert external sensors (Temperature and Irradiance) into Terminal Block or enter Setting >Sensor addr. to set temperature, irradiance, AC, and DC meter addresses. After connecting or setting successfully, the readings of sensors are showed

Figure 8.2 Sensor

3.2.4 Event

Solar ECO NAVI records fault events here to clearly show which inverter has errors occurred and when the events happen and recover.
Tap the **"Event"** icon from Tool Box to enter the image.

Figure 9 Event

Figure 9.1 Event

SN. : Inverter Serial Number
Error: Error Time
Recovery: Recovery Time
Event and Value are explained in the following table.

Table 3.2.4 Error Messages of PCM Solar Control

Variable Name	Event	Value	Explanation
Zac out of range	1.	mOhm	The AC impedance is out of range
Fac out of range	2.	Hz	The frequency is out of range
Vac out of range	3.	Volt	The AC voltage is out of range
Delta Z high	4.	mOhm	Delta Grid Z is too high
Ground I high	5.	A	Ground current is too high
Temperature high	6.	°C	Internal temperature is high
Vpv high	7.	Volt	PV voltage is too high
AC relay fails	8.	NA	Test of output relay fails
EEPROM fails	9.	NA	EEPROM R/W error
Comm fails between M-S	10.	NA	Communication fails
No-Utility	11.	NA	No grid voltage detected
DC BUS fails	12.	NA	DC bus is not correct
PV insulation low	13.	NA	Insulation range of PV to earth is too Low
DC injection high	14.	NA	The DC injection is too high
Zac differs for M-S	15.	NA	Different impedance measurement
???	16.	NA	Different Fac, Vac or Zac measurement

Fac differs for M-S	17.	NA	Different grid frequency measurement
Vac differs for M-S	18.	NA	Different grid voltage measurement
GFCI ckt fails	19.	NA	The GFCI detection is abnormal
DC sensor fails	20.	NA	The DC sensor is abnormal
Ref 2.5V fails	21.	NA	The 2.5V reference is abnormal
DC inj. differs for M-S	22.	NA	Different DC current measurement
Ground I differs for M-S	23.	NA	Different GFCI measurement
Bus-Low-Fail	24.	NA	DC Bus voltage low
Bus-High-Fail	25.	NA	DC Bus voltage High
Device-Fault	26.	NA	Device Fault

Note: The yellow part of Value means it can show figures.

Figure 9.2 Event

Tap event list, any events can be chosen to delete.

Figure 9.3 Event

Double confirm to delete or not.

Figure 9.4 Event

Solar ECO NAVI can send periodical inverter event reports via E-mail and SMS. E-mail report (Section 3.2.5.5.1) and SMS report (Section 3.2.5.5.2) can be enabled and disabled individually.

3.2.5 Setting

Tap the **"Setting"** icon from Tool Box to figure out 12 functions.

Figure 10 Setting

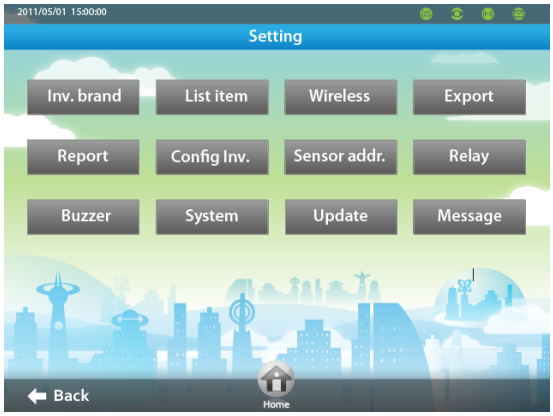


Figure 10.1 Setting

3.2.5.1 Inv brand (Inverter brand)

Select protocol for getting data from inverters. At present, the device supports PCM (Powercom) company inverter. Other brands will be supported soon.
Tap **"Inv. brand"** from Setting to enter the image.

Figure 10.2 Setting>Inv. Brand

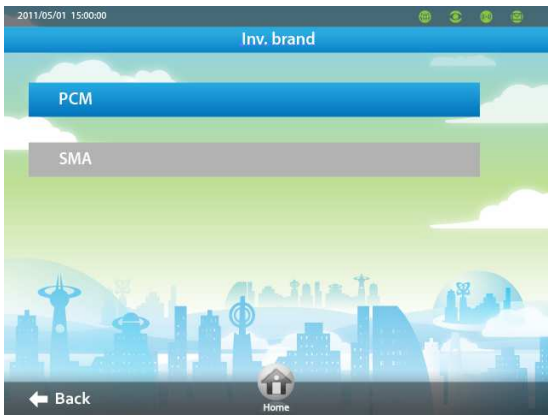


Figure 10.2.1 Setting >Inv.brand

3.2.5.2 List item

Inverter information fields are assigned a channel for referencing. Select up to 5 channels to display in InvList→ Information (Section 3.2.1)
Tap "List item" from Setting to enter the image.
On the screen, it shows 5 channels in the present information (Section 3.2.1)

Figure 10.3 Setting> List item

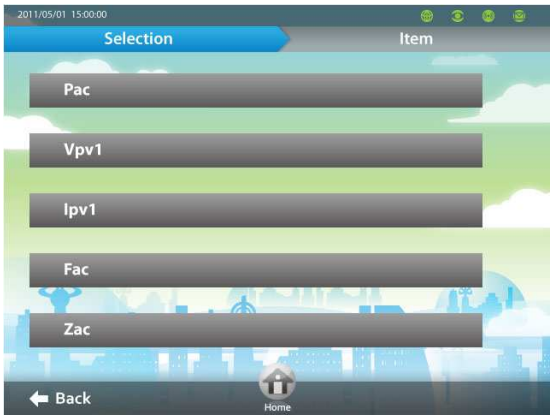


Figure 10.3.1 Setting> List item

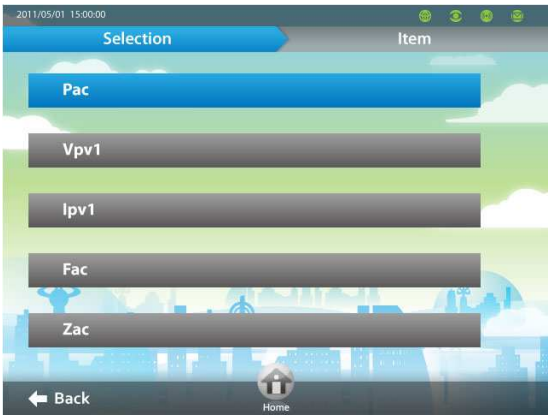


Figure 10.3.2 Setting> List item

Tap a channel to change a new inverter field.

Figure 10.3.3 Setting> List item

Tap the desired channel and then touch "Save."

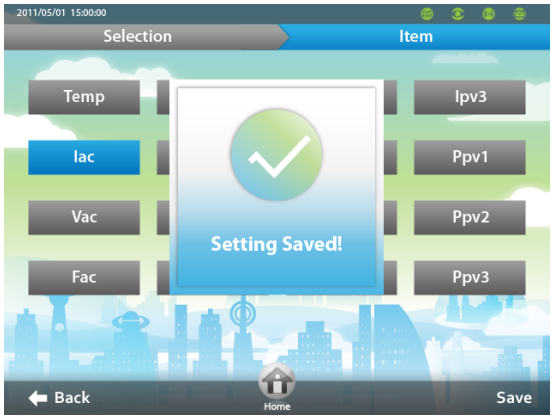


Figure 10.3.4 Setting> List item

The sign "**Setting Saved!**" appears and the desired channel can be observed in InvList→ Information (Section 3.2.1).

3.2.5.3 Wireless

Solar ECO NAVI integrates wireless communication interface. It gets inverters via Zigbee. Zigbee transmission distance is up to 500 m. The features of Zigbee are low power consumption, low-cost, numerous nodes, and high security.

Tap **"Wireless"** from Setting to enter the image.

Figure 10.4 Setting> Wireless

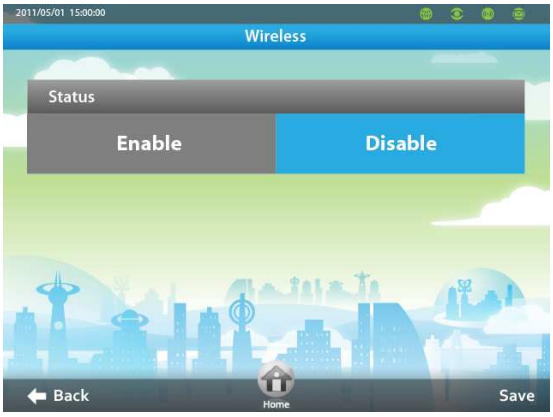


Figure 10.4.1 Setting> Wireless

Enable: To turn on wireless, tap "Enable" and then save the setting.
Disable: To turn off wireless, tap "Disable" and then save the setting.

Figure 10.4.2 Setting> Wireless

Notice:
Within 1 km, don't use two or more devices with the Zigbee wireless function to observe inverters in case of reception disturbance.

3.2.5.4 Export

By the setting, Solar ECO NAVI directs all internet-related data via the network interface to the Gateway address. The function is responsible for the correct delivery of inverter data.
Tap **"Export"** from the setting to enter the image. After tapping "Export", Solar ECO NAVI displays 5 setting options.

Figure 10.5 Setting> Export

Figure 10.5.1 Setting> Export

System IP: Set Ethernet IP address, Subnet mask, and Gateway
Data center: Set IP address list of data center for uploading actively
FTP server: Enable/Disable FTP service for uploading data passively
Local backup: Save inverter backup information as CSV (Comma Separated Values) file format into USB device
Erase all data: Erase inverter all data and events

3.2.5.4.1 System IP

Set Ethernet IP address to receive E-mail related inverter basic information and error events. Tap **"System IP"** from Export to enter the image.

Figure 10.5.1.1 Setting> Export>System IP

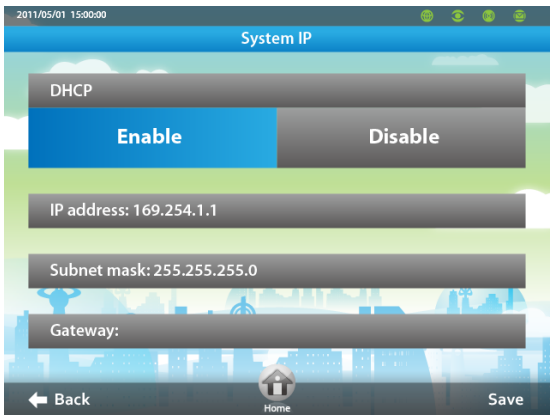


Figure 10.5.1.1.1 Setting> Export>System IP

The IP address here is given by DHCP server. To change the IP address manually, first tap "Disable" and save the setting. Three operation pictures are listed below.

Figure10.5.1.1.2 Setting>Export>System IP

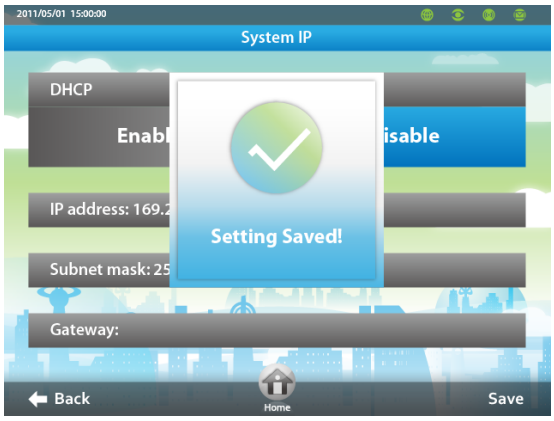


Figure10.5.1.1.3 Setting>Export>System IP

DHCP means "Dynamic Host Configuration Protocol." DHCP purpose is to enable individual computers on an IP network to extract configurations from a server (the DHCP server). For further information, please consult your network provider.

Figure10.5.1.1.4 Setting>Export>System IP

Second, set IP address, Subnet mask and Gateway to link Internet for remotely monitoring inverters.

Figure10.5.1.1.5 Setting>Export>System IP

Tap the **"IP address"** area to enter the address.

Figure 10.5.1.1.6 Setting> Export>System IP

A virtual keyboard displays for keying in IP address. Tap **"Enter"** to key in Subnet mask and Gateway addresses sequentially.

Figure 10.5.1.1.7 Setting> Export>System IP

Note:
When keying in numbers, the number range is between 0~255.
If numbers are over 255, a warning sign appears as left.

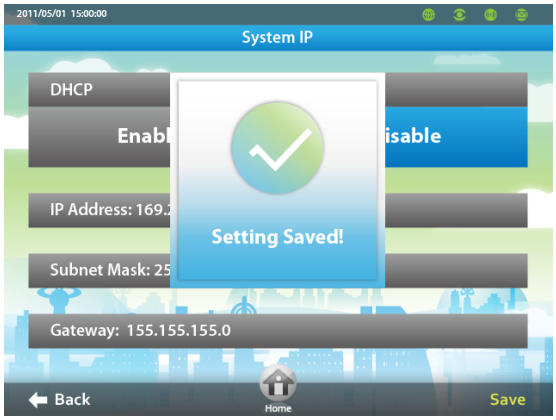


Figure 10.5.1.1.8 Setting>Export>System IP

Tap **"Save"** to keep the 3 settings.

Figure 10.5.1.1.9 Setting> Export>System IP

The device will automatically reset.

3.2.5.4.2 Data Center

After finishing IP setting, the device connects with Internet and Data Center IP can be set. The device will send inverter data to data center immediately.
Tap **"Data center"** from Export to enter the image.

Figure 10.5.1.2 Setting> Export>Data center

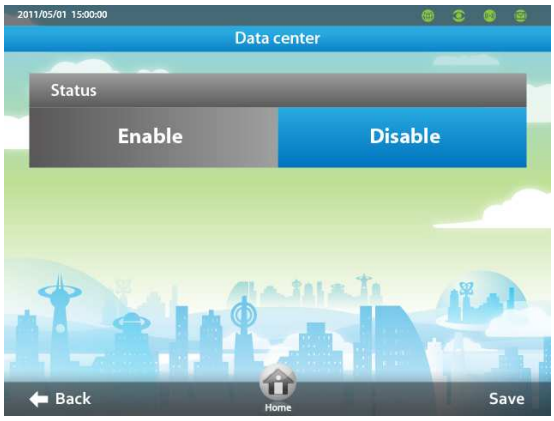


Figure10.5.1.2.1 Setting>Export>Data center

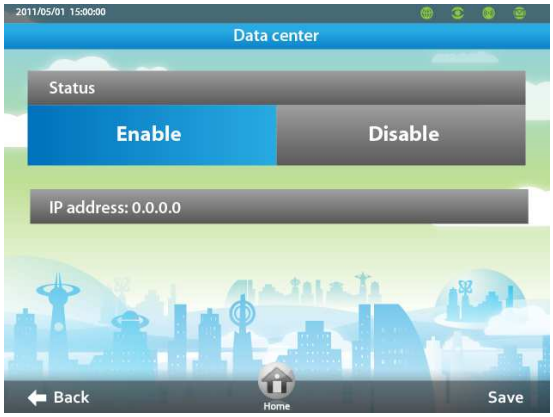


Figure10.5.1.2.2 Setting>Export>Data center

Tap **"Enable"** to display IP address

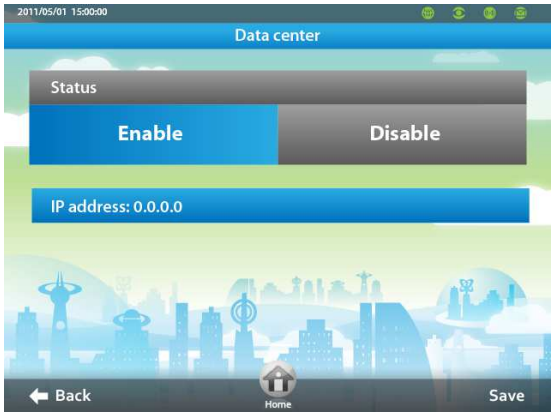


Figure10.5.1.2.3 Setting>Export>Data center

Tap **"IP address"** to key in numbers. *IP address is **210.202.53.146**.*

Figure10.5.1.2.4 Setting>Export>Data center

A virtual keyboard displays for keying in IP address and then Tap **"Enter"**.

Figure10.5.1.2.5 Setting>Export>Data center

Tap **"Save"** to keep the setting.

Figure 10.5.1.2.5 Setting> Export>Data center

Note: When keying in numbers, the number range is between 0~255. If numbers are over 255, a warning sign appears as left.

Note: Data can be synchronized on web monitoring system (Customized).

3.2.5.4.3 FTP server

Solar ECO NAVI implements FTP server and supports a subset of standard FTP commands. This function offers users to retrieve inverter data on micro SD card through Gateway from PC.

Tap **"FTP server"** from Export to enter the image.

Figure10.5.1.3 Setting>Export>FTP server

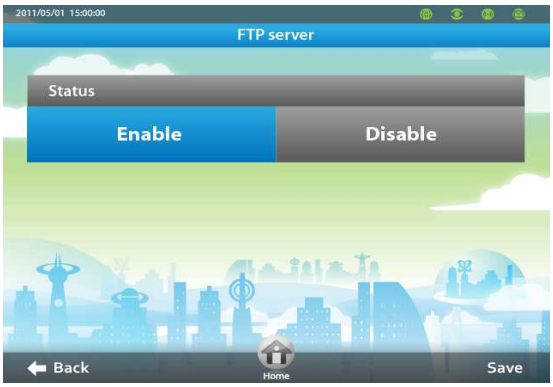
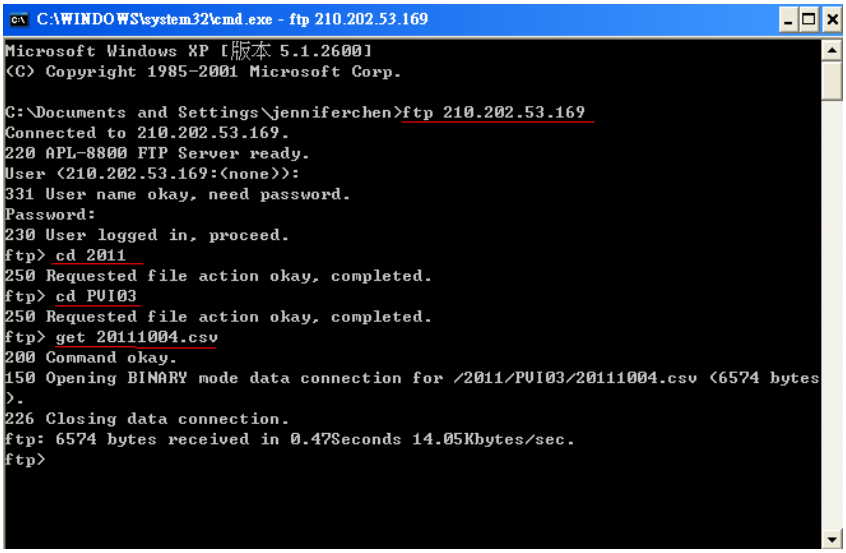


Figure10.5.1.3.1 Setting>Export>FTP server

To retrieve inverter data from computer, please refer to the following steps.

1. PC: Start→Run
2. Enter "cmd"
3. Enter "ftp xxx.xxx.xxx.xxx(System IP)"
4. "User" appears, please press "Enter" directly
5. "Password" appears, please press "Enter" directly
6. ftp> appears, enter "cd xxxx (year)"
7. ftp> appears, enter "cd PVIxx (inverter slave address)"
8. ftp> appears, enter "get xxxxooxx.csv (year month date)"
9. The example of retrieving inverter data on PC
10. Search the inverter data on your computer

There is an example below.


C:\WINDOWS\system32\cmd.exe - ftp 210.202.53.169
Microsoft Windows XP [版本 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.
C:\Documents and Settings\jenniferchen>ftp 210.202.53.169
Connected to 210.202.53.169.
220 APL-8800 FTP Server ready.
User (210.202.53.169:(none)):
331 User name okay, need password.
Password:
230 User logged in, proceed.
ftp> cd 2011
250 Requested file action okay, completed.
ftp> cd PVI03
250 Requested file action okay, completed.
ftp> get 20111004.csv
200 Command okay.
150 Opening BINARY mode data connection for /2011/PVI03/20111004.csv (6574 bytes
).
226 Closing data connection.
ftp: 6574 bytes received in 0.47Seconds 14.05Kbytes/sec.
ftp>

3.2.5.4.4 Local backup

To prevent data loss, we strongly recommend that you should backup the data in the micro SD card. Solar ECO NAVI saves inverter information as a Comma Separated Values (CSV) file format and the backup data can be retrieved by a USB stick and inspected on the computer.

Tap **"Local backup"** from Export to enter the image.

Figure 10.5.1.4 Setting>Export>Local backup *Figure 10.5.1.4.1 Setting>Export>Local backup*

Please insert a USB stick, tap "Next", and then Solar ECO NAVI starts retrieving inverter data. When downloading successfully, the image shows the sign, Complete!

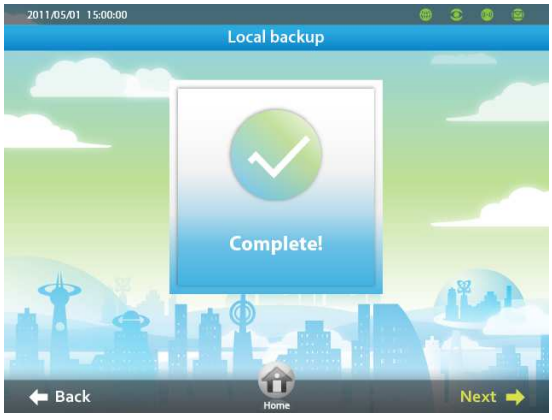


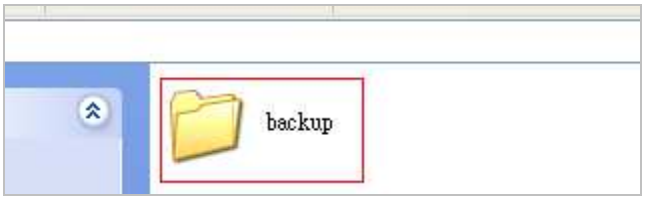
Figure10.5.1.4.2 Setting>Export>Local backup *Figure10.5.1.4.3 Setting>Export>Local backup*

Note: Please note re-download can't directly overwrite the data in the USB stick unless the original backup file is removed from PC first.
Hence, for retrieving the latest inverter backup data, delete the original backup file in the USB is the priority.

If not inserting a USB stick well or not downloading successfully, a warning sign appears.

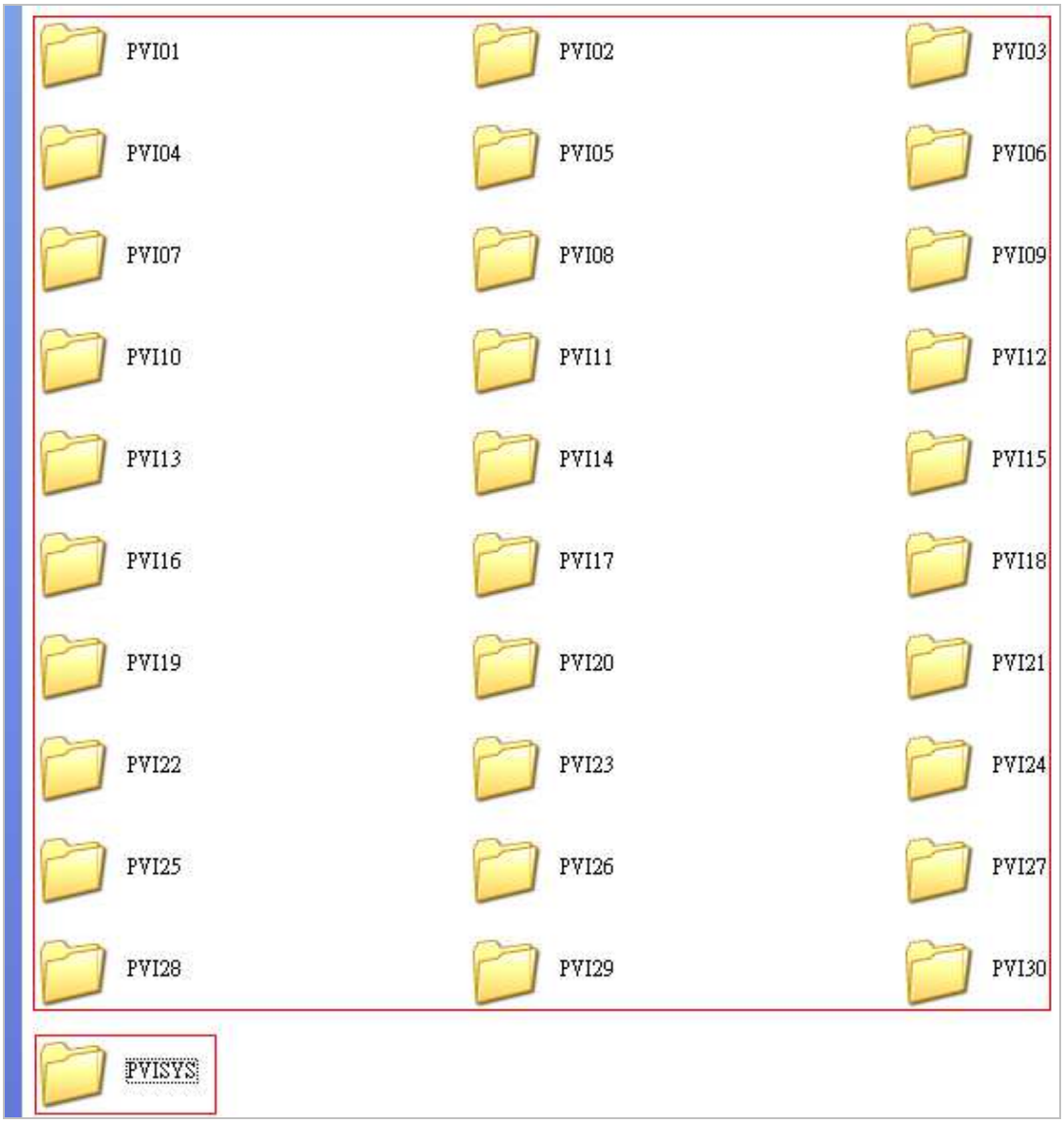
Figure 10.5.1.4.4 Setting > Export>Local backup

To read out the data in the micro SD card, please insert the downloaded USB stick into a computer, and the backup file will be found.



Click the backup file, the inverter information folder and error event file will be shown as below.

Click the inverter information folder, and then it shows 30 inverter folders and a sensor folder. According to the inverter number on Inverter List, click one file to select one day.



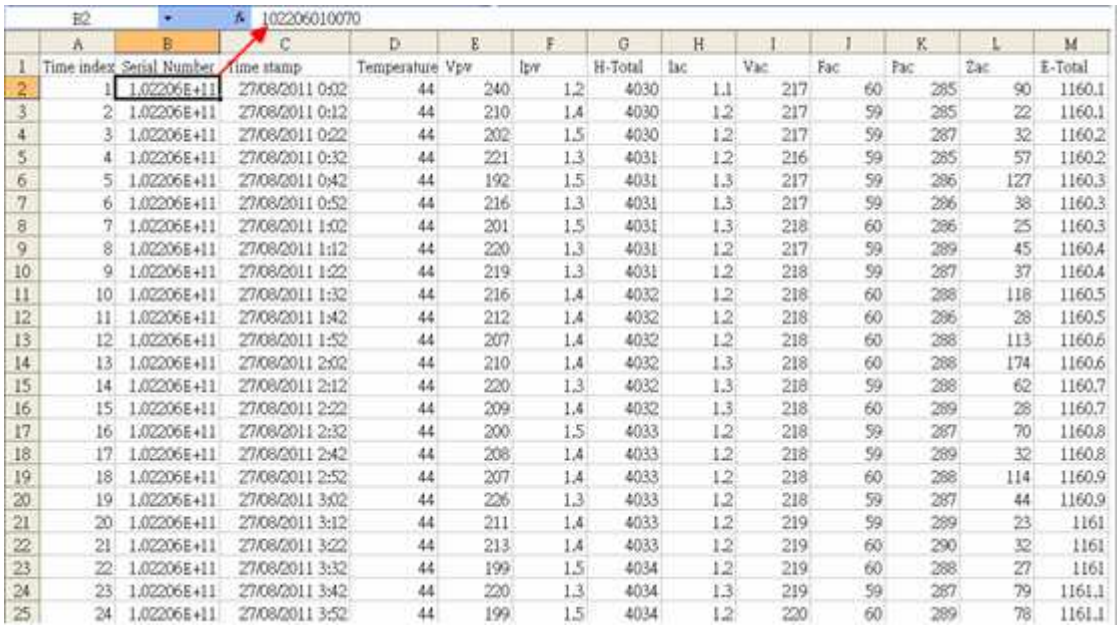
Choose one day to view inverter information.

Time index: This is numbered by Time Stamp order.

Time stamp: The time interval is 10 minutes, and the time is counting from the first generation of power.

Temperature: Inverter internal temperature.

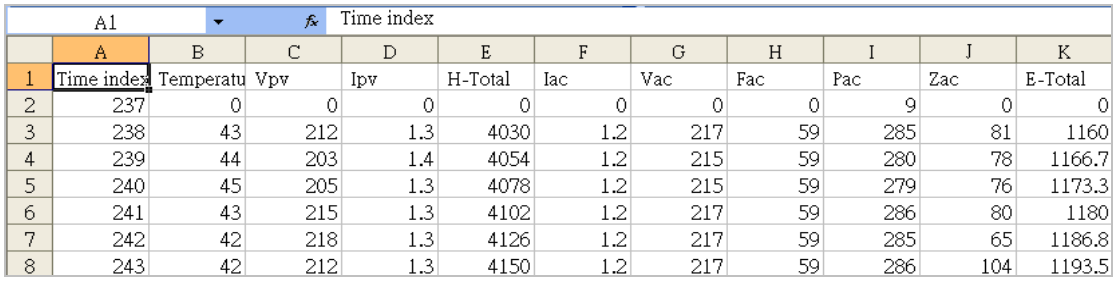
H-Total: The accumulated hour that Solar Energy System works from the first day of generating power.



Time index	Serial Number	Time stamp	Temperature	Vpv	Ipv	H-Total	Iac	Vac	Fac	Pac	Zac	E-Total
1	1.02206E+11	27/08/2011 0:02	44	240	1.2	4030	1.1	217	60	285	90	1160.1
2	1.02206E+11	27/08/2011 0:12	44	210	1.4	4030	1.2	217	59	285	22	1160.1
3	1.02206E+11	27/08/2011 0:22	44	202	1.5	4030	1.2	217	59	287	32	1160.2
4	1.02206E+11	27/08/2011 0:32	44	221	1.3	4031	1.2	216	59	285	57	1160.2
5	1.02206E+11	27/08/2011 0:42	44	192	1.5	4031	1.3	217	59	286	127	1160.3
6	1.02206E+11	27/08/2011 0:52	44	216	1.3	4031	1.3	217	59	286	38	1160.3
7	1.02206E+11	27/08/2011 1:02	44	201	1.5	4031	1.3	218	60	286	25	1160.3
8	1.02206E+11	27/08/2011 1:12	44	220	1.3	4031	1.2	217	59	289	45	1160.4
9	1.02206E+11	27/08/2011 1:22	44	219	1.3	4031	1.2	218	59	287	37	1160.4
10	1.02206E+11	27/08/2011 1:32	44	216	1.4	4032	1.2	218	60	288	118	1160.5
11	1.02206E+11	27/08/2011 1:42	44	212	1.4	4032	1.2	218	60	286	28	1160.5
12	1.02206E+11	27/08/2011 1:52	44	207	1.4	4032	1.2	218	60	288	113	1160.6
13	1.02206E+11	27/08/2011 2:02	44	210	1.4	4032	1.3	218	60	288	174	1160.6
14	1.02206E+11	27/08/2011 2:12	44	220	1.3	4032	1.3	218	59	288	62	1160.7
15	1.02206E+11	27/08/2011 2:22	44	209	1.4	4032	1.3	218	60	289	28	1160.7
16	1.02206E+11	27/08/2011 2:32	44	200	1.5	4033	1.2	218	59	287	70	1160.8
17	1.02206E+11	27/08/2011 2:42	44	208	1.4	4033	1.2	218	59	289	32	1160.8
18	1.02206E+11	27/08/2011 2:52	44	207	1.4	4033	1.2	218	60	288	114	1160.9
19	1.02206E+11	27/08/2011 3:02	44	226	1.3	4033	1.2	218	59	287	44	1160.9
20	1.02206E+11	27/08/2011 3:12	44	211	1.4	4033	1.2	219	59	289	23	1161
21	1.02206E+11	27/08/2011 3:22	44	213	1.4	4033	1.2	219	60	290	32	1161
22	1.02206E+11	27/08/2011 3:32	44	199	1.5	4034	1.2	219	60	288	27	1161
23	1.02206E+11	27/08/2011 3:42	44	220	1.3	4034	1.3	219	59	287	79	1161.1
24	1.02206E+11	27/08/2011 3:52	44	199	1.5	4034	1.2	220	60	289	78	1161.1

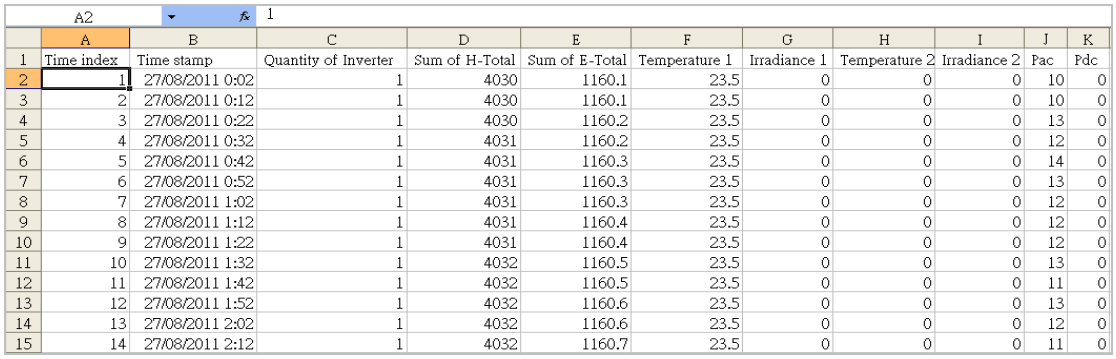
Choose DAYAVG to view average inverter information within a day.

Time index: The day is counting from January 1st.



Time index	Temperatu	Vpv	Ipv	H-Total	Iac	Vac	Fac	Pac	Zac	E-Total
237	0	0	0	0	0	0	0	9	0	0
238	43	212	1.3	4030	1.2	217	59	285	81	1160
239	44	203	1.4	4054	1.2	215	59	280	78	1166.7
240	45	205	1.3	4078	1.2	215	59	279	76	1173.3
241	43	215	1.3	4102	1.2	217	59	286	80	1180
242	42	218	1.3	4126	1.2	217	59	285	65	1186.8
243	42	212	1.3	4150	1.2	217	59	286	104	1193.5

Click PVISYS folder to view the sensor readings.



Time index	Time stamp	Quantity of Inverter	Sum of H-Total	Sum of E-Total	Temperature 1	Irradiance 1	Temperature 2	Irradiance 2	Pac	Pdc
1	27/08/2011 0:02	1	4030	1160.1	23.5	0	0	0	10	0
2	27/08/2011 0:12	1	4030	1160.1	23.5	0	0	0	10	0
3	27/08/2011 0:22	1	4030	1160.2	23.5	0	0	0	13	0
4	27/08/2011 0:32	1	4031	1160.2	23.5	0	0	0	12	0
5	27/08/2011 0:42	1	4031	1160.3	23.5	0	0	0	14	0
6	27/08/2011 0:52	1	4031	1160.3	23.5	0	0	0	13	0
7	27/08/2011 1:02	1	4031	1160.3	23.5	0	0	0	12	0
8	27/08/2011 1:12	1	4031	1160.4	23.5	0	0	0	12	0
9	27/08/2011 1:22	1	4031	1160.4	23.5	0	0	0	12	0
10	27/08/2011 1:32	1	4032	1160.5	23.5	0	0	0	13	0
11	27/08/2011 1:42	1	4032	1160.5	23.5	0	0	0	11	0
12	27/08/2011 1:52	1	4032	1160.6	23.5	0	0	0	13	0
13	27/08/2011 2:02	1	4032	1160.6	23.5	0	0	0	12	0
14	27/08/2011 2:12	1	4032	1160.7	23.5	0	0	0	11	0

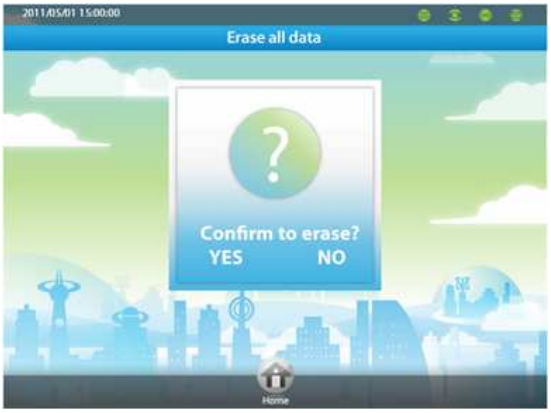
3.2.5.4.5 Erase all data

To delete all inverter data on the micro SD card, enter the password first and a confirmation window prompts. Make sure to erase all inverter data, tap "Yes."

Tap **"Erase all data Local"** from Export to enter the image.

Figure10.5.1.5 Setting>Export>Erase all data *Figure10.5.1.5.1 Setting>Export>Erase all data*

When a virtual keyboard displays, enter the password: erase



A warning sign double confirms to erase all inverter data. Tap "Yes" and the two following displays are below.

Figure 10.5.1.5.2 Setting>Export>Erase all data

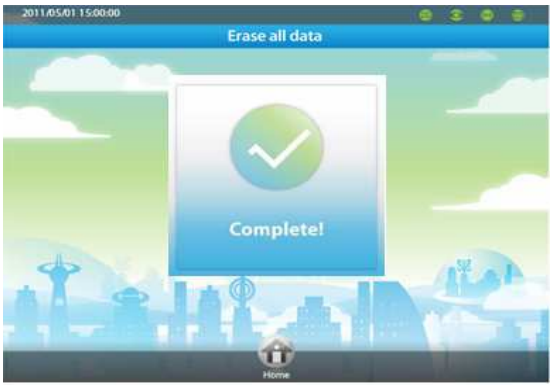


Figure10.5.1.5.3 Setting>Export>Erase all data *Figure10.5.1.5.4 Erase all data>Completed*

3.2.5.5 Report

Inverter basic information and in the event of abnormal operation due to system error or grid problem, Solar ECO NAVI generates an alert which is sent via E-mail and SMS. Use the following steps to configure Solar ECO NAVI E-mail and SMS settings.

Tap **"Report"** from Setting and enter the image.

Figure 10.6 Setting>Report

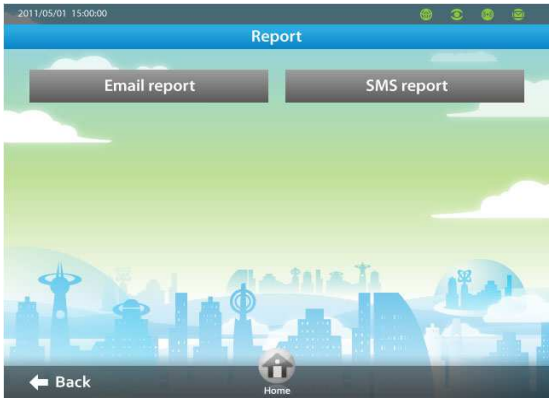


Figure 10.6.1 Setting>Report

E-mail report: Set 3 recipients' E-mail addresses for sending reports.
SMS report: Set 3 recipients' cellular phone No. for sending messages.

3.2.5.5.1 Email report

This function sends inverter basic information and error events via E-mail automatically. Please remember the device should connect with Internet first! Here can set 3 E-mail addresses, and it also can be selected the sending time. Before using this function, please make sure System IP setting successfully.
Tap **"Email report"** from Setting and enter the image.

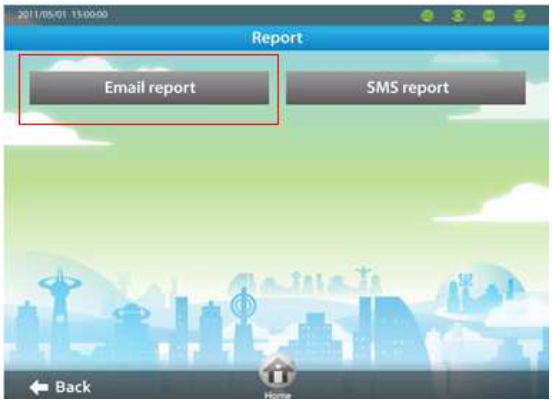


Figure10.6.1.1 Setting>Report>Email

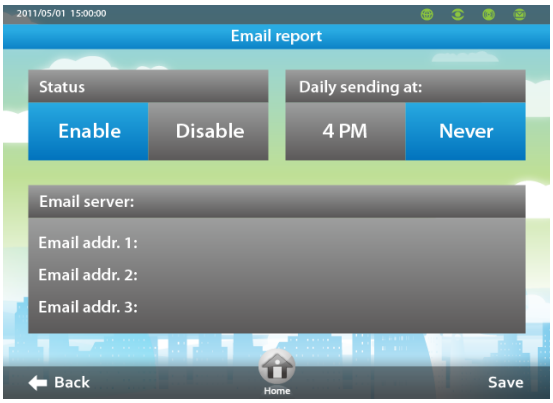


Figure10.6.1.1.1 Setting>Report> Email

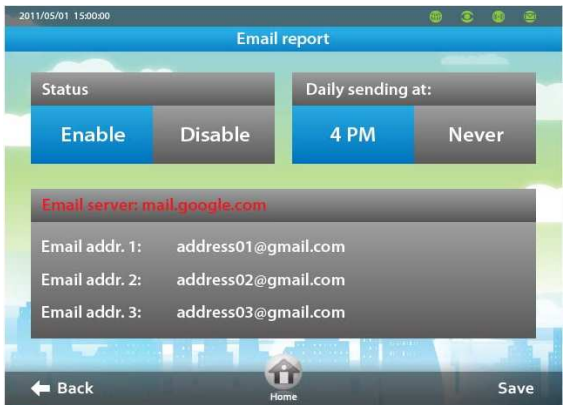


Figure10.6.1.1.2 Setting>Report>Email

(1)Toggle "Enable" or "Disable" to activate or deactivate Email report.

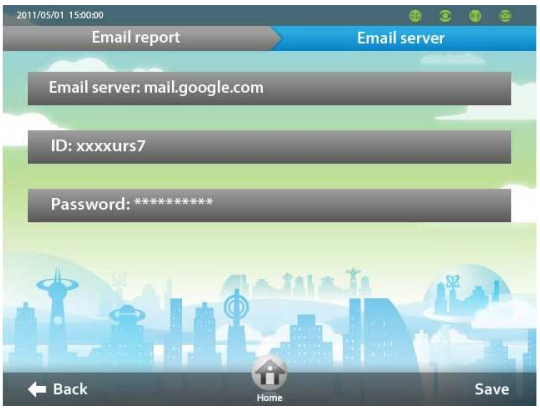


Figure10.6.1.1.3 Setting>Report>Email

(2)To set E-mail server/ ID/ Password, tap the editing area, and then a virtual keyboard displays.

Figure10.6.1.1.4 Setting>Report>Email

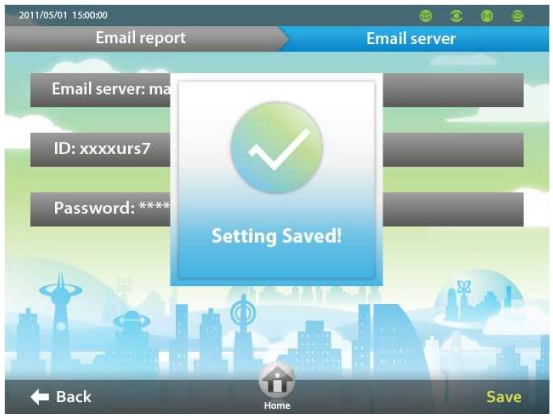


Figure10.6.1.1.5 Setting >Report>Email

Finish tapping the letters and numbers on the virtual keyboard, tap "Save" to keep the setting without making any change.

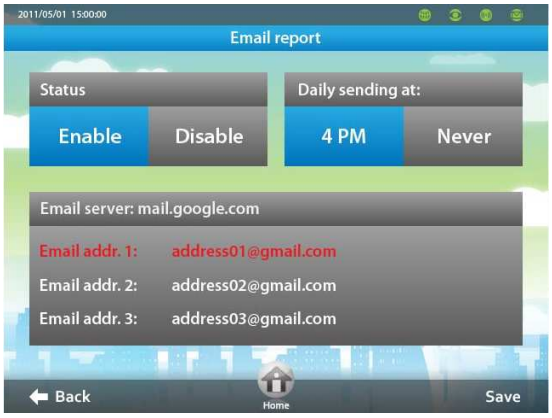


Figure10.6.1.1.6 Setting>Report>Email

(3)Set recipients' E-mail addresses manually. Tap the editing area to set one recipient's E-mail address, for example, Email add.1.

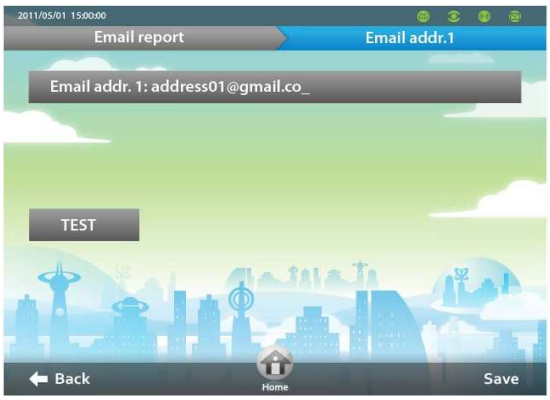


Figure10.6.1.1.7 Setting>Report>Email

Tap "Email addr. 1" and key in the first recipient's E-mail address when the screen displays a virtual keyboard.

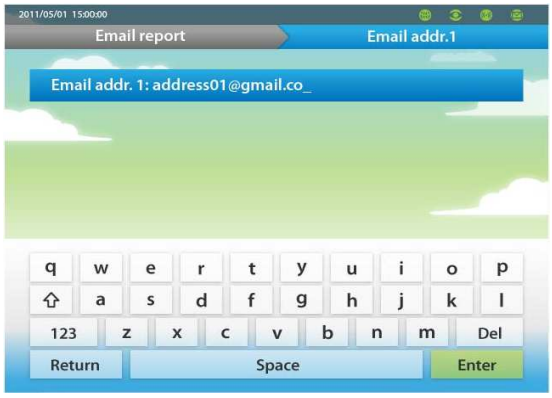

2011/05/01 15:00:00
Email report
Email addr.1
Email addr. 1: address01@gmail.co_
q w e r t y u i o p
a s d f g h j k l
123 z x c v b n m Del
Return Space Enter

Figure10.6.1.1.8 Setting>Report>Email

After finishing keying in the recipient's E-mail address, tap "Enter" to the previous image.

Figure 10.6.1.1.8.1 Setting>Report> Email>keyboard

Tap ⇧ the arrow symbol on the left side of the keyboard, and then the keyboard shifts the small letters to the capital letters.

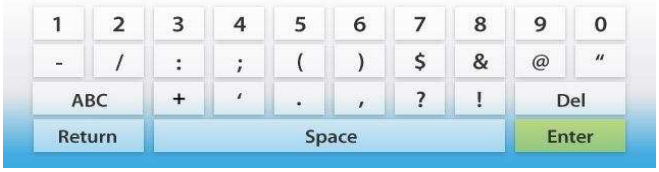


Figure 10.6.1.1.8.2 Setting>Report> Email>keyboard

Tap the 123 symbol on the left side of the keyboard, and then the keyboard changes to numbers and punctuation marks.

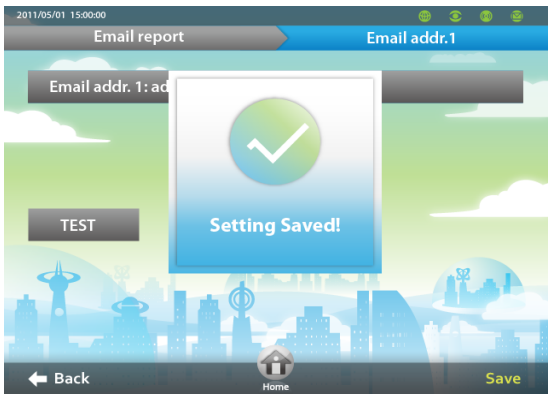


Figure10.6.1.1.9 Setting>Report>Email

Tap "Save" to keep the setting and the image automatically returns to Email report main interface.

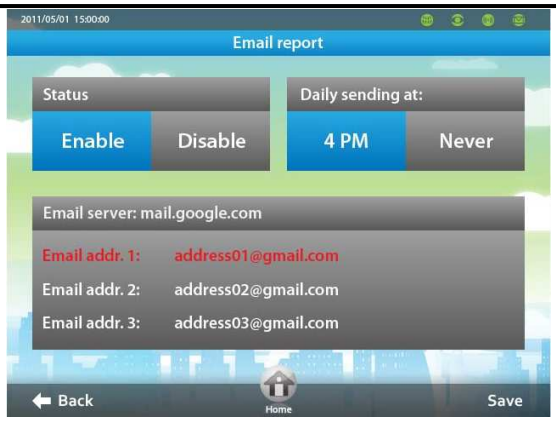


Figure10.6.1.1.10 Setting>Report>Email

(4)Tap saved Email addr.1 to send the inverter information to the recipient.

Figure10.6.1.1.11 Setting>Report>Email

Tap "TEST" to send test inverter information immediately.

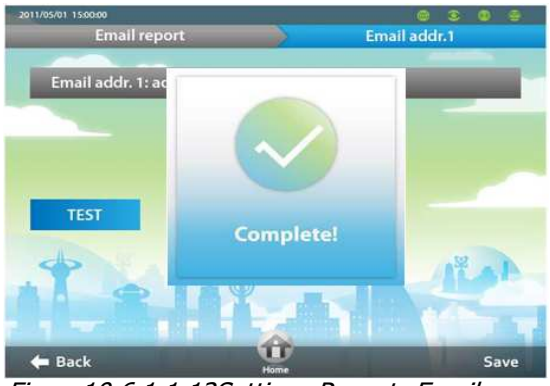


Figure10.6.1.1.12Setting>Report>Email

When transmitting successfully, the image shows the sign, Complete!

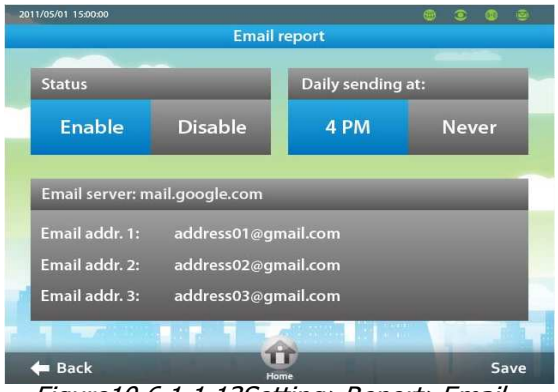


Figure10.6.1.1.13Setting>Report>Email

(5)Set the indicated time for sending the inverter information to recipients daily. Tap the present time to change.

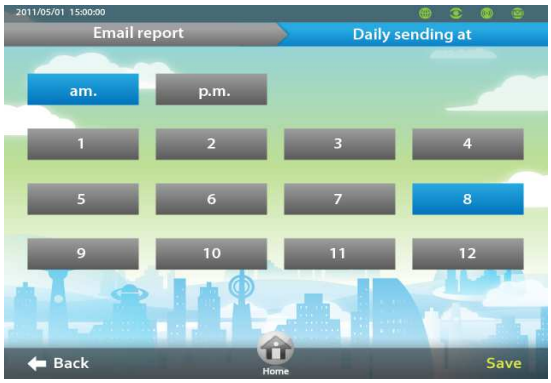


Figure10.6.1.1.14Setting>Report>Email

Select the time to send inverter daily report.

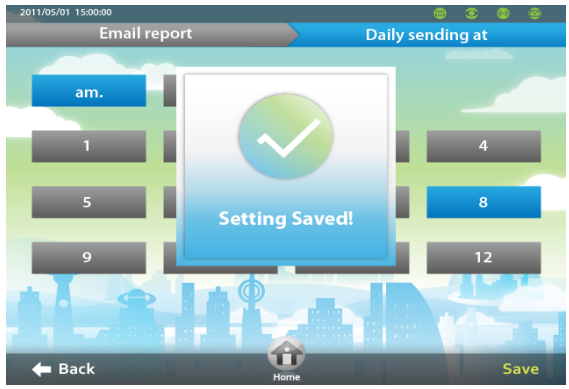


Figure10.6.1.1.15Setting>Report>Email

Tap "Save" and keep the setting.

Note: The E-mail server is a computer on a network that provides "post office" facilities for outgoing and incoming emails. Please contact your network administrator for the server name.

3.2.5.5.2 SMS report

Solar ECO NAVI integrates SMS (Short Message Service) report to send inverter information and error events to recipients' cell phone, so inverter information can be monitored anytime and anywhere. The SMS requirement is a GSM modem with a telephone line. Use the following procedure to configure Solar ECO NAVI for SMS report.

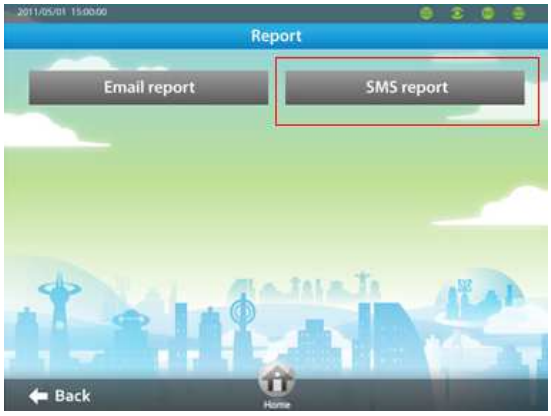


Figure 10.6.1.2 Setting>Report> SMS

(1)Tap **"SMS report"** from Report and enter the image.

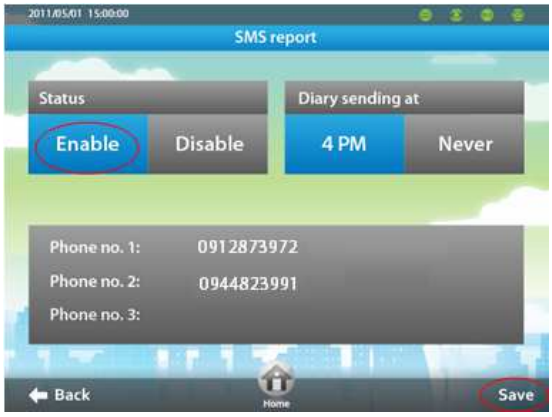


Figure 10.6.1.2.1 Setting>Report>SMS

Tap "Enable" to turn on SMS report function

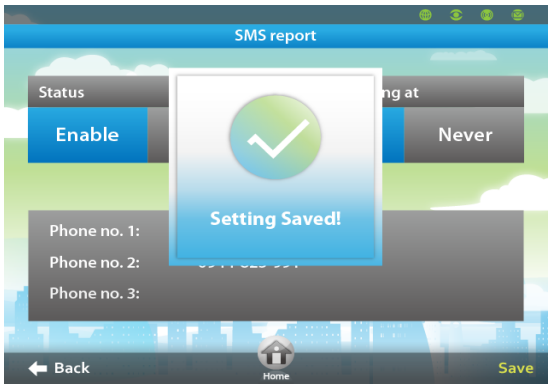


Figure 10.6.1.2.2 Setting>Report>SMS

Tap "Save" to keep the setting.

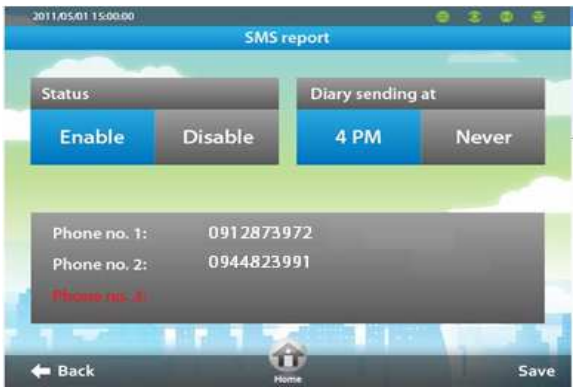


Figure 10.6.1.2.3 Setting>Report>SMS

(2)Set the recipient's cell phone no.

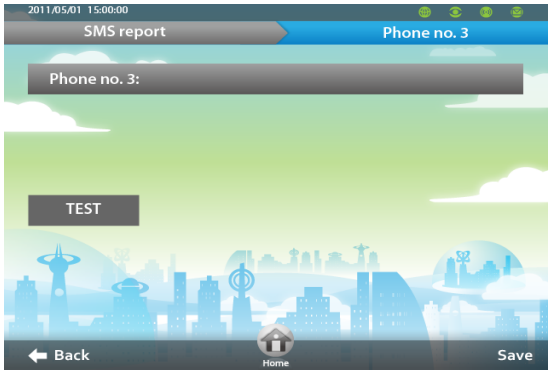


Figure 10.6.1.2.4 Setting>Report>SMS

If making an international phone call, the phone no. format is country code+ area code+ phone number.

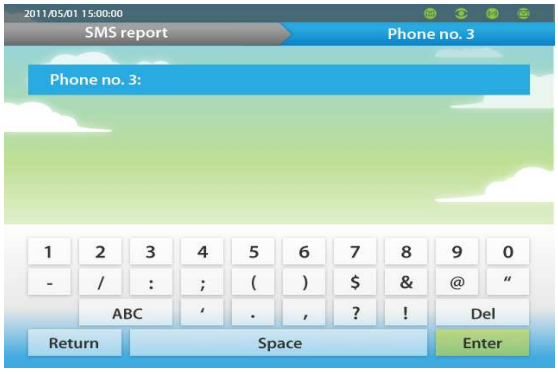


Figure 10.6.1.2.5 Setting>Report>SMS

Tap the "Phone no." area, and a virtual keyboard displays. Then, tap "Enter" to the previous screen.

Figure 10.6.1.2.6 Setting>Report>SMS

Tap "Save" to keep the phone number.

Figure 10.6.1.2.7 Setting>Report>SMS

(3) Tap "Test" to send a test SMS. If all the settings are correct, the mobile phone listed in "Phone no" will receive the SMS.

Figure 10.6.1.2.8 Setting>Report>SMS

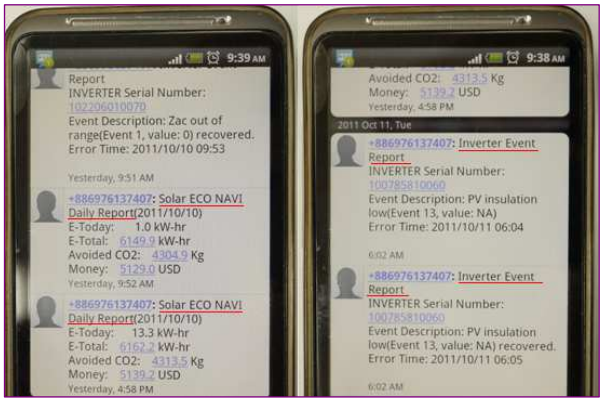


Figure 10.6.1.2.9Setting>Report>SMS

Note: GSM Modem M100evo is optional equipment. SMS can be sent after inserting a SIM card and flashing red light.

3.2.5.6 Config. Inv.

Inverter parameters can be modified in this function. To set the operational parameters of an inverter, refer to the following procedure. Please note that the function is password protected.

Figure 10.6 Setting>Config. Inv.

Tap **"Config Inv."** in the setting, the list of available inverters displays.

Figure 10.6.1 Setting>Config. Inv.

To view or change the parameter settings for an inverter, tap that inverter.

Figure 10.6.2 Setting>Config. Inv.

Tap "Set" to input a new value for the a field of interest.

Figure 10.6.3 Setting>Config. Inv.

Solar ECO NAVI prompts for password window. After entering the password in the virtual keypad, tap "Enter" to modify parameters.

Note: Do not change the parameters unless you are an approved service engineer. Alterations must be approved by the local utility supplier. Incorrect settings can result in abnormal operation.

Figure 10.6.4 Setting>Config. Inv.

Tap any item, a virtual keyboard displays; meanwhile, there is a red referable range for entering a value next to the inverter serial number. After inputting a new value, please tap "Enter" to set the next parameter repetitively.

Figure 10.6.5 Setting>Config. Inv

Tap "Save" to keep the setting.

Table 3.2.5.6 The setting range for each item

Item	*Range*	*Item*	*Range*
Vpv-Start	140V~ 150V	Fac-Min	57.00Hz~63.00Hz
T-Start	20 Sec~300Sec	Fac-Max	57.00Hz~63.00Hz
Vac-Min	180V~251V	DC Offset	0 m-Amp~30 m-Amp
Vac-Max	198V~300V	Trip Time	0 m-Sec~20 m-Sec

3.2.5.7 Sensor addr. (Sensor address)

Besides external sensors, using digital electric meter is more precise to monitor sensor values. After setting Temperature, Irradiance, AC, and DC meter addresses, sensor values will show in Sensor (section 3.2.3). More, digital electric meter can use wired connection with Solar ECO NAVI or use a Zigbee wireless transmission to send sensor values to Solar ECO NAVI.

Tap **"Sensor addr."** in the setting to enter the image.

Figure 10.7 Setting>Sensor addr.

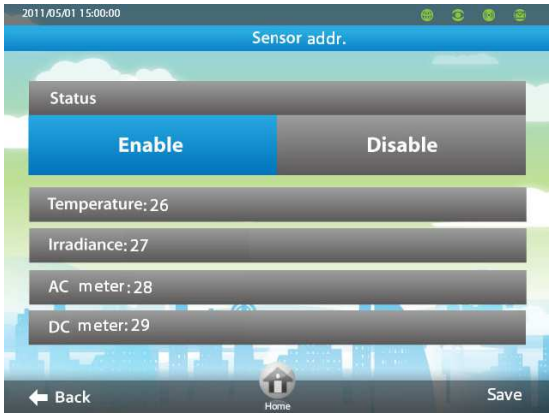


Figure 10.7.1 Setting>Sensor addr.

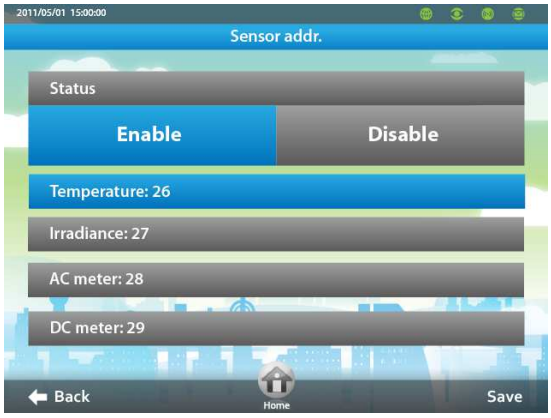


Figure 10.7.2 Setting>Sensor addr.

Tap one editing area, and a virtual keyboard displays.

Figure 10.7.3 Setting>Sensor addr.

After keying in the correct address, tap "Enter" to set another sensor address.

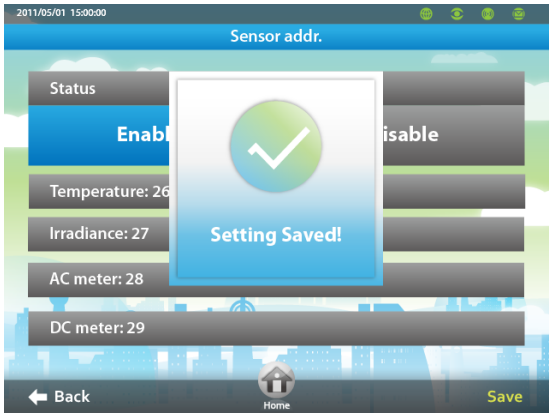


Figure 10.7.4 Setting>Sensor addr.

Check all of sensor addresses are right, and tap "Save" to keep the setting.

Note: Please set sensor address no. between 26 and 255.
This setting range is to avoid the inverter slave address number on Modbus RS485 Card between 1 and 25.

3.2.5.8 Relay

This function is used to warn users of an unexpected event. There is an alarm on the inside of Solar ECO NAVI. If inverter events happen, Solar ECO NAVI will make clicking sound.

Figure 10.8 Setting>Relay

Tap **"Relay"** in the setting and enter the image.

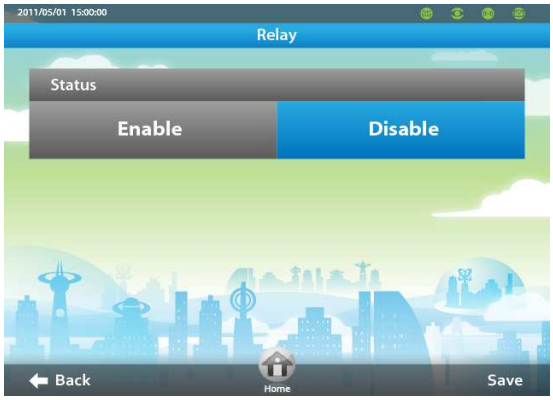


Figure 10.8.1 Setting>Relay

To enable/disable the relay, please tap the related area on the screen.

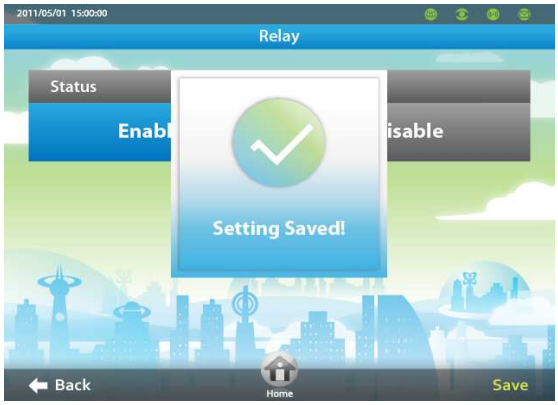


Figure 10.8.2 Setting>Relay

After configuring the screen, remember to tap "Save" to keep the setting.

3.2.5.9 Buzzer

There is a buzzer on the inside of Solar ECO NAVI. If turn on the function, Solar ECO NAVI will make beeping sound when touching any function keys.

Figure 10.9 Setting>Buzzer

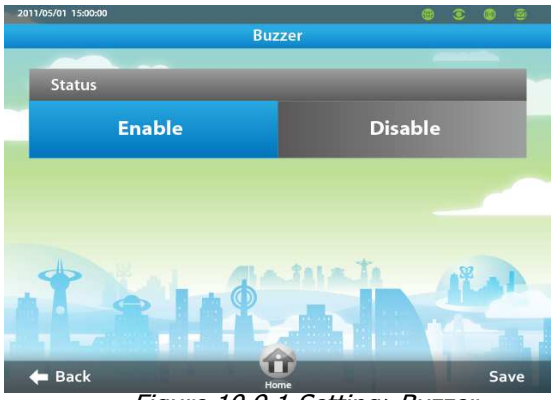


Figure 10.9.1 Setting>Buzzer

Tap **"Buzzer"** in the setting and enter the image.

Tap "Enable" or "Disable" to activate/ deactivate this function.

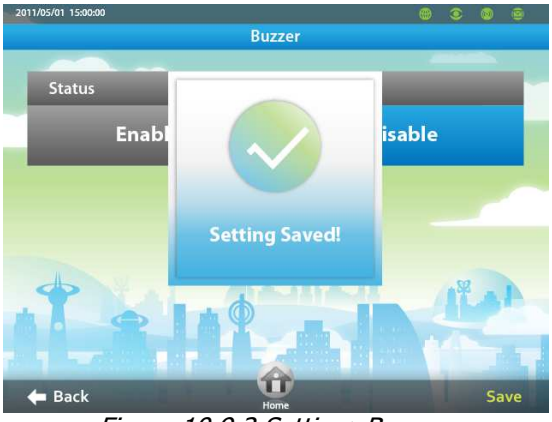


Figure 10.9.2 Setting>Buzzer

After configuring the screen, remember to tap "Save" to keep the setting.

3.2.5.10 System

6 screen displays can be adjusted: Avoided CO_2, Adjust touch screen, Feed-in Tariff, Standby mode, Date & Time, and Language.

Tap **"System"** in the setting to enter the image.

Figure 10.10 Setting>System

Figure 10.10.1 Setting>System

3.2.5.10.1 Avoided CO_2

Avoided CO_2 emission is the 5th item on the right side of Homepage (section 3.2). It is the accumulated CO_2 emissions that Solar Energy System avoids producing from the first day of generating power. Avoided CO_2 coefficient can be set according to the regulations of each region or country.

Tap **"Avoided CO_2"** in the system to enter the image.

Figure10.10.1.1Setting>System>Avoided CO_2

Figure10.10.1.1.1Setting>System>Avoided CO_2

Figure 10.10.1 .1.2 Setting>System>Avoided CO_2

Tap the editing area, and a virtual keyboard displays. After inputting a coefficient (e.g. 0.7), tap "Enter" to make sure the number.

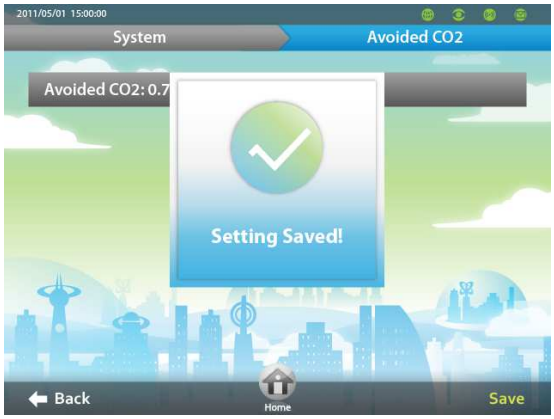


Figure10.10.1.1.3Setting>System>Avoided CO_2

Tap "Save" to keep the setting.

Tap the "Home" icon to view the value.

Calculate avoided CO_2 emission→

TOTAL YIELD X Avoided CO_2 coefficient:

7289.5 X 0.7 =5102.6

3.2.5.10.2 Adjust touch screen

The function is about screen alignment. In case you find the response of tapping is not correct, you may adjust the correspondence of the touch panel to keep it precise and functional.

Tap **"Adjust touch screen"** in the system and enter the image.
Follow the instructions to touch each X as they appear (six in total) from upper left to right. After that, the screen returns to the System display automatically.

Figure 10.10.1.2 Setting>System> Adjust touch screen

Figure10.10.1.2.1Setting>System> Adjust touch screen

3.2.5.10.3 Feed-in Tariff

Money is the 4th item on the right side of Homepage (section 3.2). It is the accumulated revenues that the unit calculates according to the tariff from the first working day of Solar Energy System. Tariff can be set according to the regulations of each region or country.
Tap **"Feed-in Tariff"** in the system and enter the image.

Figure10.10.1.3 Setting>System>Feed-in Tariff

Figure10.10.1.3.1 Setting>System>Feed-in Tariff

Figure 10.10.1.3.2 Setting>System>Feed-in Tariff

Tap the currency area, USD and EURO display for choice.

Figure10.10.1.3.3Setting>System>Feed-in Tariff

Tap one currency to show on the homepage.

Figure10.10.1.3.4 Setting>System>Feed-in Tariff

Tap "Save" to keep the setting.

Tap the "Home" icon to view the change.

Figure 10.10.1.3.5 Setting>System>Feed-in Tariff

Next, set a new tariff to re-calculate the revenue.

Figure 10.10.1.3.6 Setting>System>Feed-in Tariff

Tap the editing area, and a virtual keyboard displays. After inputting a new tariff (e.g. 0.534), tap "Enter" to make sure the number.

Figure 10.10.1.3.7 Setting>System>Feed-in Tariff

Tap "Save" to keep the setting.

Tap the "Home" icon to view the value.
Calculate Money→TOTAL YIELDX Tariff
: 7289.5 X 0.534=3892.5

3.2.5.10.4 Standby mode

Solar ECO NAVI enters a standby mode after a period of inactivity. In this mode, LED light flashes and Solar ECO NAVI turns off the back-light to save power. Although no contents shown on the screen, Solar ECO NAVI is still recording the data from inverter. To wake the unit up, touch any part of the LCD screen.

Figure 10.10.1 .4 Setting>System>Standby mode

Tap **"Standby mode"** in the system to enter the image.

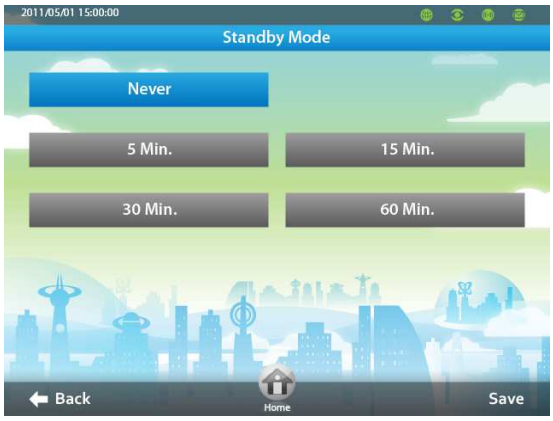
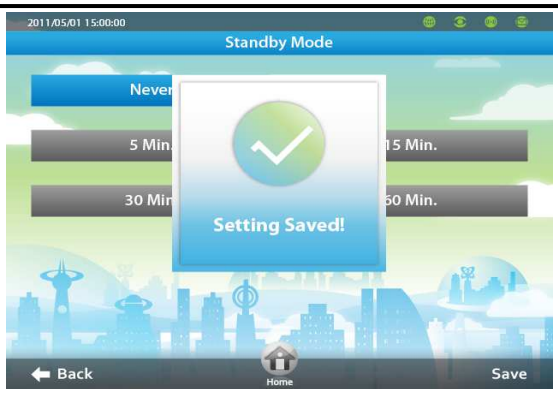


Figure 10.10.1 .4 .1 Setting>System>Standby mode

Set the time to get into standby mode.

Never: Solar ECO NAVI never enters standby mode.
5 Min.: After 5 minutes of inactivity, Solar ECO NAVI enters standby mode.
15 Min.: After 15 minutes of inactivity, Solar ECO NAVI enters standby mode.
30 Min.: After 30 minutes of inactivity, Solar ECO NAVI enters standby mode.
60 Min.: After 60 minutes of inactivity, Solar ECO NAVI enters standby mode.



Tap **"Save"** to keep the setting.

Figure 10.10.1.4.2 Setting>System>Standby mode

3.2.5.10.5 Date & Time

Adjust the date and time of the device. Solar ECO NAVI integrates the world map to adjust time exactly.

Tap **"Date & Time"** in the system to enter the image.

Figure 10.10.1.5Setting>System>Date&Time

Figure10.10.1.5.1Setting>System>Date&Time

Figure10.10.1.5.2Setting>System>Date&Time

Figure10.10.1.5.3 Setting>System>Date&Time

(1)Tapping "Time zone" displays a world map to select the located time zone.

Tap ◀ ▶ to select time zone. Change time zone, and the time on the upper left of the screen will alter relatively.

Tap "Save" to keep the setting.

Figure10.10.1.5.4Setting>System>Date&Time

The examples for each time zone list below.
UTC-12: Baker Island, Howland Island
UTC-11: Samoa, American Samoa
UTC-10: Hawaii, Papeete
UTC-9: Anchorage, Fairbanks
UTC-8: Las Vegas, California, San Jose, San Francisco, Seattle
UTC-7: Alberta, Colorado, Phoenix, Salt Lake City, Billings
UTC-6: Chicago, Costa Rica, New Orleans, Houston, Chicago
UTC-5: Ottawa, Toronto, Atlanta, Columbia, Orlando
UTC-4: Nova Scotia, Dominican Republic, St. John, Charlottetown
UTC-3: Rio de Janeiro, São Paulo, Nuuk, Saint Pierre
UTC-2: Fernando de Noronha
UTC-1: Azores, Cape Verde
UTC-0: Iceland, Faroe Islands, Lisbon, London
UTC+1: Albania, Slovenia, Germany, Paris, Lyon
UTC+2: Finland, Lithuania, Athens, Istanbul, Ankara
UTC+3: Samara, Iraq
UTC+4: Georgia, Armenia
UTC+5: Sverdlovsk, Uzbekistan
UTC+6: Novosibirsk, Almaty
UTC+7: Kransnoyarsk, Thailand
UTC+8: Taiwan, Hong Kong, Manila
UTC+9: Zabaykalsky, Japan
UTC+10: Victoria, Tasmania, Saipan
UTC+11: Solomon Islands, New Caledonia
UTC+12: Fiji, New Zealand

Figure10.10.1.5.5Setting>System>Date&Time

(2)Tapping date and time area reveals a keyboard. Input the correct setting by tapping the related numbers. Tap "Enter" to confirm the settings.

Figure10.10.1.5.6Setting>System>Date&Time

(3)Choose the rank of year, month and date, and this will show on the upper left of the screen. After completing the 3 steps, tap "Save" to keep the setting.

Three ranks of year, month and date:
1. dd/mm/yyyyy: date/month/year
2. mm/dd/yyyy: month/date/year
3. yyyy/mm/dd: year/month/date

Note: There is a battery on the inside of Solar ECO NAVI for the real-time clock. Turning off Solar ECO NAVI over 2 weeks will affect time accuracy.

3.2.5.10.6 Language

Solar ECO NAVI supports 5 different languages: English, German, Spanish, French, and Italian.

Figure10.10.1.6Setting>System>Language

Tap **"Language"** in the system and enter the image.

Figure10.10.1.6.1Setting>System>Language

Select one of the displayed languages.

Tap “Save” to keep the setting.

Figure10.10.1.6.2Setting>System>Language

3.2.5.11 Update

Update the latest software version. Please visit our company website to download the latest version and update Solar ECO NAVI.
Tap **“Update”** in the setting and enter

Figure 10.11 Setting>Update

Tap **“Update”** in the setting and enter the image.

Figure 10.11.1 Setting>Update

Please insert a USB stick, tap “Next”, and then Solar ECO NAVI starts updating a new version.

Figure 10.11.2 Setting>Update

When updating successfully, Solar ECO NAVI will reset for a new version.

Finally, To POWERCOM website regularly for software updates and downloads.

3.2.5.12 Message

This section contains 3 messages of Solar ECO NAVI: help, version, and license.
Tap **"Message"** in the setting and enter the image.

Figure 10.12 Setting>Message

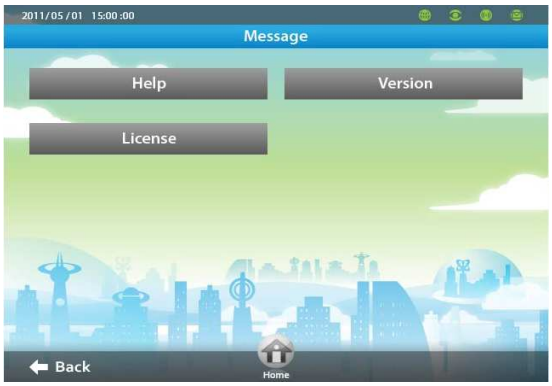


Figure 10.12.1 Setting>Message>Help

3.2.5.12.1 Help

The contents of help provide the related product and Web monitoring system website.
Tap **"Help"** in the message and enter the image.

Figure 10.12.1.1Setting>Message>Help

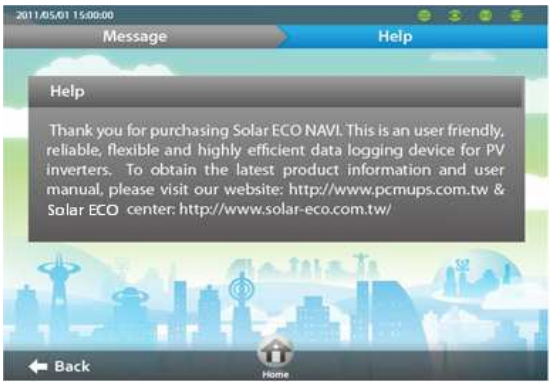

Message
Help
Help
Thank you for purchasing Solar ECO NAVI. This is an user friendly, reliable, flexible and highly efficient data logging device for PV inverters. To obtain the latest product information and user manual, please visit our website: http://www.pcmups.com.tw & Solar ECO center: http://www.solar-eco.com.tw/
Back
Home

Figure 10.12.1.1 .1Setting>Message>Help

3.2.5.12.2 Version

After updating the latest software version, the version can be viewed on the boot screen or checked in this interface.

Tap **"Version"** in the message and enter the image.

Figure10.12.1.2Setting>Message>Version

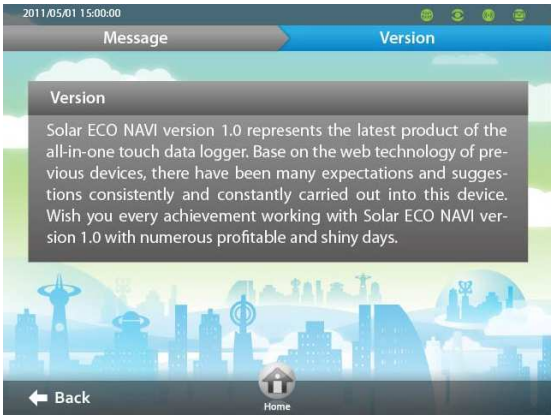

2011/05/01 15:00:00
Message
Version
Version
Solar ECO NAVI version 1.0 represents the latest product of the all-in-one touch data logger. Base on the web technology of previous devices, there have been many expectations and suggestions consistently and constantly carried out into this device. Wish you every achievement working with Solar ECO NAVI version 1.0 with numerous profitable and shiny days.
Back
Home

Figure10.12.1.2.1Setting>Message>Version

3.2.5.12.3 License

Solar ECO NAVI has passed CE and FCC tests and acquired the certifications. The formal certifications are in CE & FCC Certification (section 3.5).

Tap **"License"** in the message and enter the image.

Figure10.12.1.3Setting>Message>License

Figure10.12.1.3.1Setting>Message>Version

3.3 Product specification

Model	Solar ECO NAVI
Power Supply	100-240V,50-60Hz Input, 12V/1A DC
Main Machine	Size: 20 × 20 × 3.65 cm IP 20 protection class
LCD Screen	5.6-inch TFT touch panel, 640×480 pixels/65K colors
Operating Temperature	-10 to 40℃
Storage Temperature	-20 to 60℃
Alarm Relay	Rating:1A /24VDC
	Terminals:4x1 socket (C, C,NO,NC)
Communication Interface	RS232:DB9 male connector for PC/Modem; Baud Rate: 9600bps
	RS485: 4X1 socket (R+,R-, T+, T-),full-duplex for connection to inverter terminals
	Ethernet: RJ45 socket; 10/100M bit
Analog Input	Pin 2 & Pin 3 (for Temperature Sensors) Input Resistance Range, 0 - 5K ohms
	Pin 5 & Pin 6 (for Irradiance Sensors) Input Impedance, 1M ohms
	Input Voltage Range, 0 - 150mV
Maximum Inverters connected	20 inverters
Storage Type	Micro SD card , 1 G memory capacity

3.4 Troubleshooting

The following table lists potential difficulties and their solutions. Please try to use the troubleshooting table before contacting with your vendor.

Problem	Symptom	Suggested Actions
Startup	No response	■Check the adapter is properly connected. ■Ensure the correct AC adapter is used. ■Turn on Solar ECO NAVI manually as in section 3.1
RS232 (COM1)	No communication with inverters	■Check the wiring that is correct or not. ■Check the RS232 cable to make sure it is the standard one.
RS232 (COM2)	No communication with GSM Modem	■Check the GSM modem setting is correct or not. ■Check the connected modem is working or not.
RS485/ RS422	No communication with inverters.	■Please check the settings are correct as in section 2.5.2 ■Ensure the RS485 card is working. ■Ensure the RS485 connected pin assignment is the same as Solar ECO NAVI. ■Check the connected line is functioning correctly.
LAN	Can't communicate with Ethernet	■Ensure the RJ45 cable is connected. ■Ensure the Ethernet network is functioning. ■Please check the Solar ECO NAVI IP address setting as in section 3.2.5.4.1
Display	No display	■Please touch the display again; the device may be in the standby mode. ■If the display freezes, check the ambient temperature is above -10 degrees Celsius. Colder temperatures could damage the display.
	Touch screen is not accurate	■Use the "Adjust touch screen" function in section 3.2.5.10.4. ■Follow the screen instructions to recalibrate the screen.
Date & Time	PC backup data are not the same as Solar ECO NAVI	■Check the time, date and time zone settings to make sure they are the same. ■Adjust the setting.

3.5 CE & FCC Certification

Verification of Compliance

Product Name	:	**SOLAR ECO NAVi**
Model Number	:	**SLK-ECO1, SLK-ECO2, SLK-ECO3**
Applicant	:	**POWERCOM CO., LTD.**
Address	:	**8F.,NO.246,LIEN CHEN ROAD CHUNG HO CITY,TAIPEI HSIEN TAIWAN,R.O.C.**
Report Number	:	**C22-R020-1106-334**
Issue Date	:	**July 11, 2011**
Applicable Standards	:	**EN 55022:2006+A1:2007 Class B** **EN 61000-3-2:2006+A1:2009+A2:2009** **EN 61000-3-3:2008** **EN 55024:1998+A1:2001+A2:2003** EN 61000-4-2:1995+A1:1998+A2:2001 EN 61000-4-3:2006+A1:2008 EN 61000-4-4:2004 EN 61000-4-5:2006 EN 61000-4-6:2009 EN 61000-4-8:1993+A1:2001 EN 61000-4-11:2004

One sample of the designated product has been tested in our laboratory and found to be in compliance with the EMC standards cited above and covered by the EMC Directive 2004/108/EC.

CE

TAF 0905
FCC CAB Code TW1053
NVLAP Lab Code 200575-0
IC Code 4699A
VCCI Accep. No. R-1527, C-1609, T-131, T-1441, G-10

Central Research Technology Co.
EMC Test Laboratory
11, Lane 41, Fushuen St., Jungshan Chiu,
Taipei, Taiwan, 104, R.O.C.
Tel : 886-2-25984568
Fax: 886-2-25984546

J. Y.

(Tsun-Yu Shih/ General Manager)
Date: July 11, 2011

Verification of Compliance

Product Name	:	**SOLAR ECO NAVi**
Model Number	:	**SLK-ECO1, SLK-ECO2, SLK-ECO3**
Applicant	:	**POWERCOM CO., LTD.**
Address	:	**8F.,NO.246,LIEN CHEN ROAD CHUNG HO CITY,TAIPEI HSIEN TAIWAN,R.O.C.**
Report Number	:	**F-R020-1106-334**
Issue Date	:	**July 11, 2011**
Applicable Standards	:	**FCC Part 15, Subpart B Class B** **ANSI C63.4:2003**

One sample of the designated product has been tested in our laboratory and found to be in compliance with the FCC rules cited above.

NVLAP LAB CODE 200575-0

TAF 0905
FCC CAB Code TW1053
IC Code 4699A
VCCI Accep. No. R-1527, C-1609, T-131, T-1441, G-10

Central Research Technology Co.
EMC Test Laboratory
11, Lane 41, Fushuen St., Jungshan Chiu,
Taipei, Taiwan, 104, R.O.C.
Tel : 886-2-25984568
Fax: 886-2-25984546

(Tsun-Yu Shih/ General Manager)
Date: July 11, 2011

PCM